Dec. 20, 1966 M. GARANCSY 3,292,329

BUILDING CONSTRUCTION

Filed March 21, 1963 5 Sheets-Sheet 1

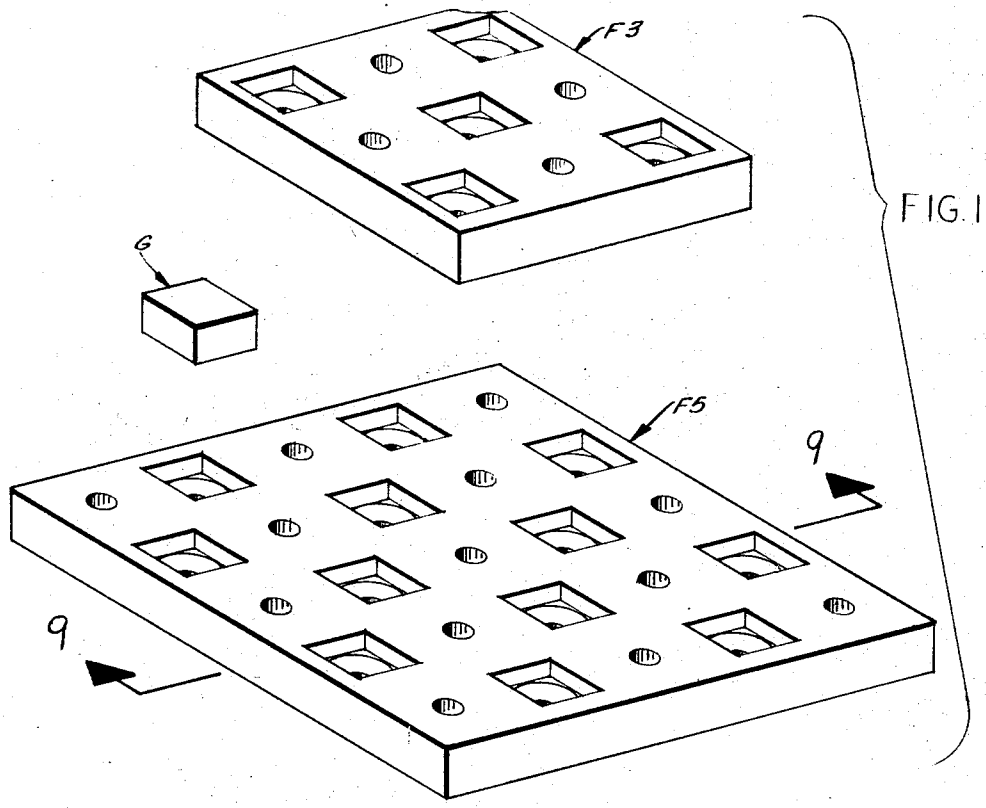


FIG. 1



FIG. 9

Mihlon Garancsy
INVENTOR.

BY Oldham & Oldham
ATTYS.

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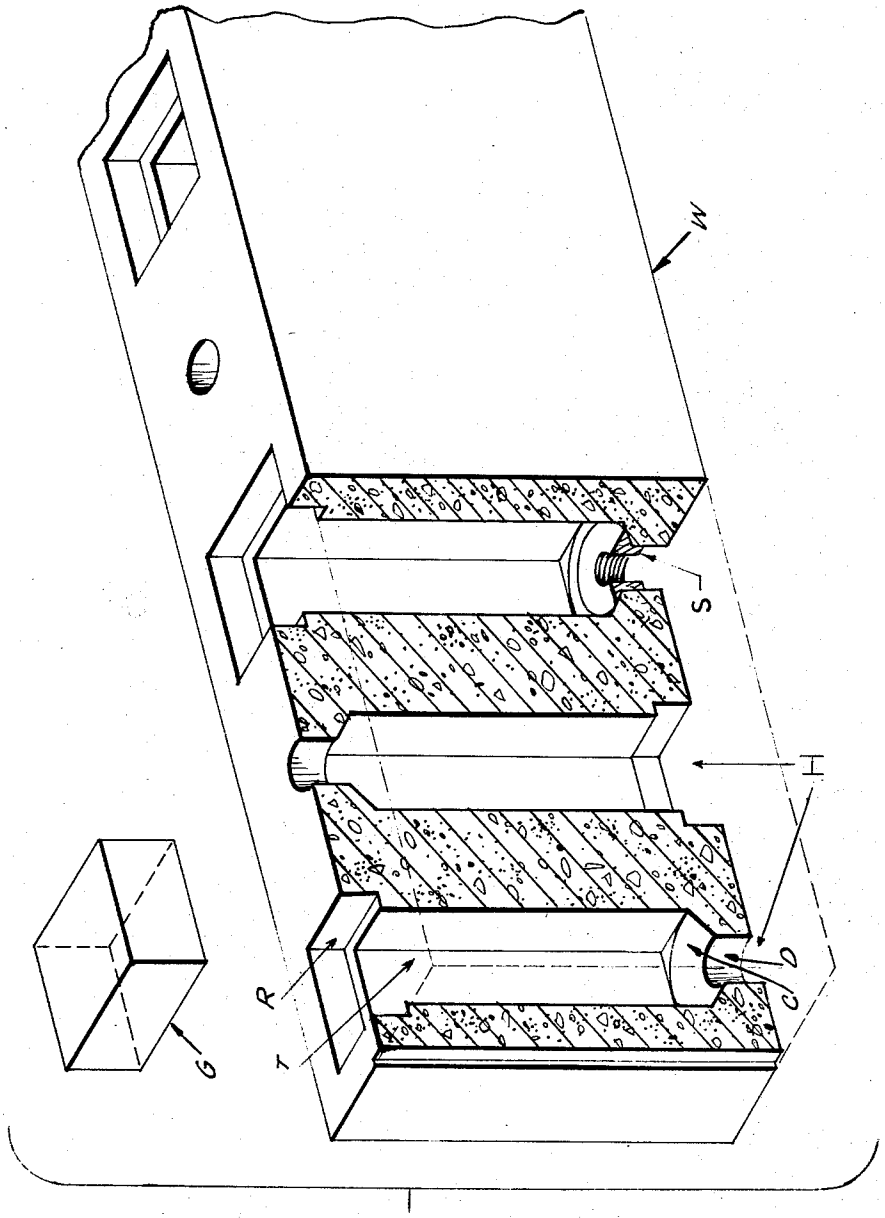


FIG. 2

Mihlos Garancsy
INVENTOR.

BY Oldham & Oldham
ATTYS.

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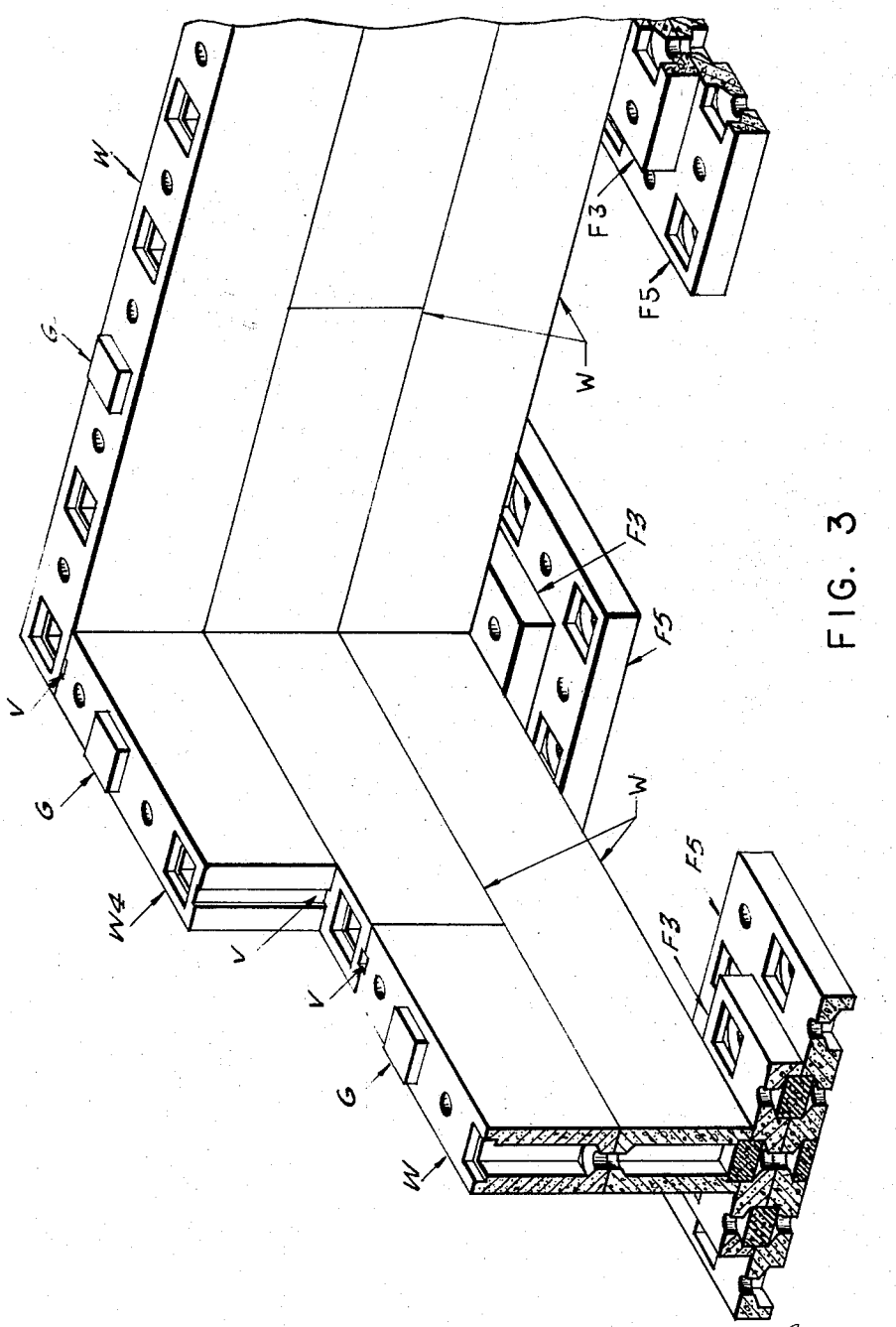


FIG. 3

Mihlos Garancsy
INVENTOR.

BY Oldham & Oldham
ATTYS.

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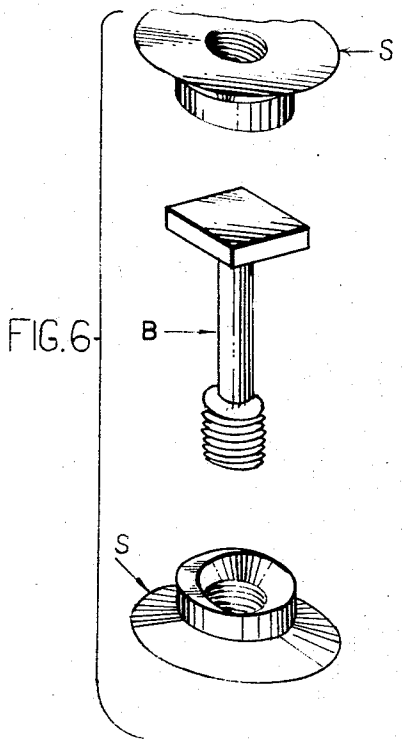


FIG. 6

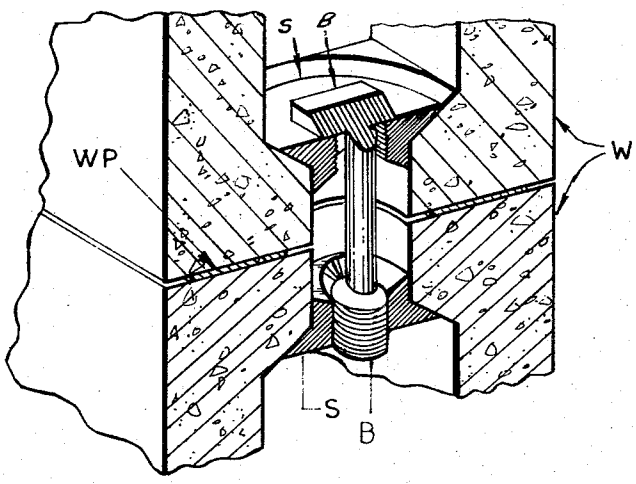


FIG. 4

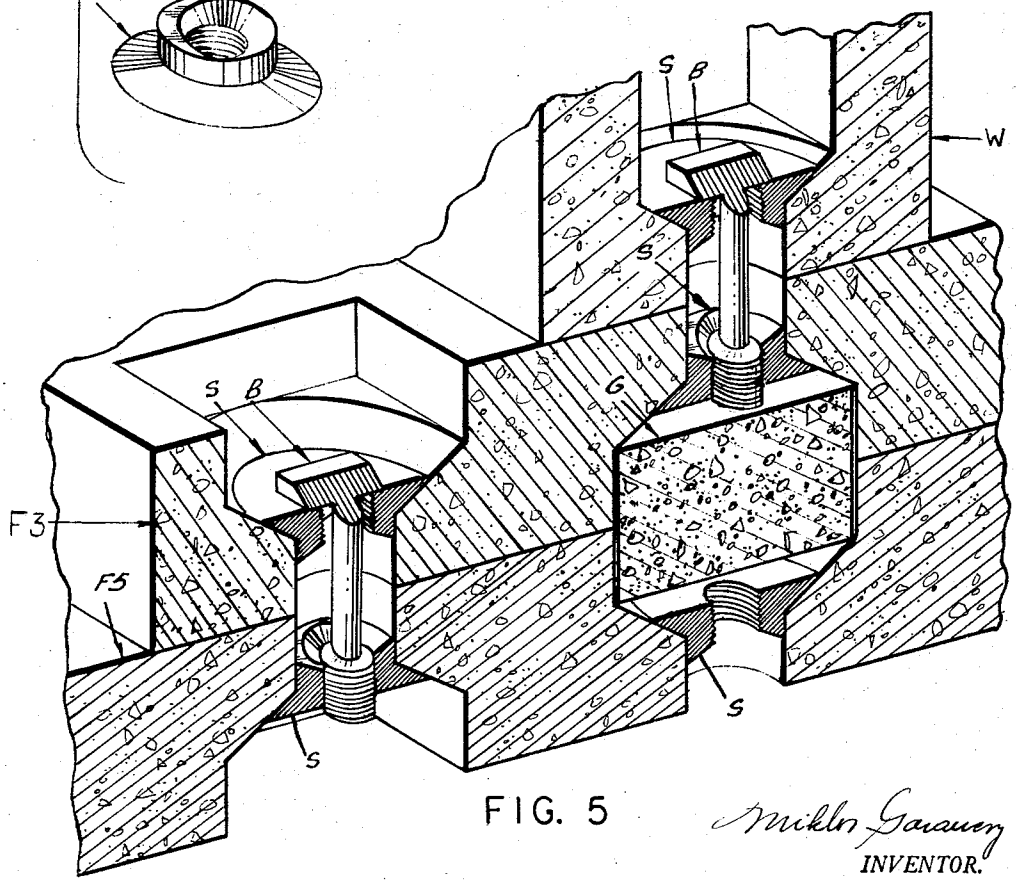


FIG. 5

Miklos Garancsy
INVENTOR.

BY Oldham & Oldham
ATTYS.

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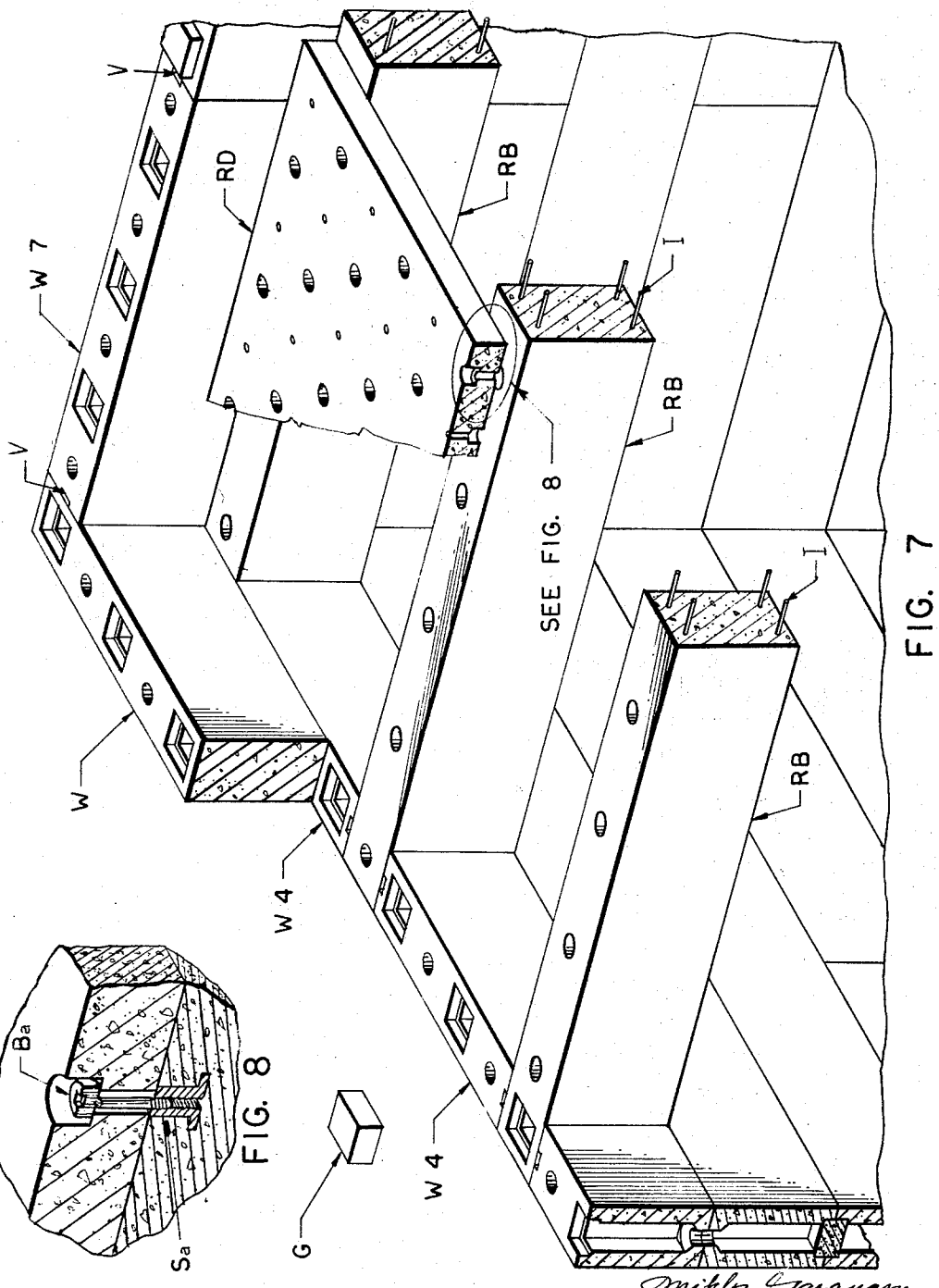


FIG. 7

FIG. 8

Mihly Garancsy
INVENTOR.

BY Oldham & Oldham
ATTYS.

United States Patent Office 3,292,329 Patented Dec. 20, 1966

3,292,329

BUILDING CONSTRUCTION

Miklos Garancsy, 3072 Livingstone Road, Cleveland, Ohio 44120

Filed Mar. 21, 1963, Ser. No. 266,949
8 Claims. (Cl. 52—251)

This invention relates to building construction, and, more particularly, to improved blocks, beams, elements, and pads of concrete for facilitating, strengthening and improving such construction.

Heretofore it has been known that conventional precast concrete blocks have been utilized in building construction, with these blocks being formed in rectangular shape and mortared together with cement or concrete to form the construction. Construction in this manner requires considerable skill in masonry, is time consuming and is not attractive, and is readily recognized for what it is, namely, a mediocre structure. Further, the strength in this structure is not great, as only the mortar between blocks is used to hold the construction together. Also, there have been efforts to make construction blocks which dovetail together, or utilize rod means to hold the blocks together, but these means have proved to be extremely expensive, and difficult to use.

It is the general object of the invention to avoid and overcome the foregoing and other difficulties of and objections to prior art practices by the provision of precast building blocks and elements adapted to be utilized for building construction, which blocks can be readily and easily assembled by an ordinary workman, and which include bolt and wedge means rather than mortar to permanently affix adjacent elements and blocks in vertical and horizontal relation to each other so that the construction has great stability, strength, and rigidity.

Another object of the invention is the provision of a weathertight, strong concrete block building which can be assembled without mortar and to many shapes.

Another object of the invention is to provide precast concrete elements adapted for a wide variety of building constructions wherein the elements take different forms which can all be securely attached to each other to provide an excellent appearance and so that an entire building structure can be completed utilizing the elements of the invention.

Another object of the invention is to provide precast blocks adaptable for building construction, which blocks can be quickly assembled to any desired building configuration, which blocks are comparable in cost to conventional concrete blocks, and which blocks require less labor costs to effect construction therewith so that the overall cost of building construction is substantially reduced.

Another object of the invention is to provide building construction blocks which will achieve a superior construction in strength and durability, which can be easily assembled, and which can be precast for costs comparable with conventional building blocks.

Another object of the invention is to provide precast module type building blocks which in the wall-forming blocks usually have a thickness such as a conventional building block, but greater height and length or which can be formed in shapes much larger or smaller than conventional building blocks, as the construction situation demands.

Another object of the invention is to provide precast concrete elements which when assembled into a building form substantially finished inside and outside walls which may be further finished only if desired.

The aforesaid objects of the invention, and other objects which will become apparent as the description proceeds, are achieved by providing in a building construction the combination of a plurality of precast blocks of rectangular shape, each block having a plurality of bores through the vertical height thereof with the bores being equally spaced along the longitudinal center line of the blocks, each bore having a slightly tapered square recess on one end thereof, a slightly tapered square hole of less cross sectional area than the recess extending from the recess towards the other end of the bore, a sharply tapered conical shaped recess formed at the end of the square hole opposite the square recess, and a circular hole extending from the bottom of the conically shaped recess to the other end of the bore to thereby complete the bore, said bores being arranged alternately so that one bore has the square recess upwardly and the next bore has the circular hole upwardly, each vertically adjacent block being laterally offset but having at least certain of the bores therein aligned so that a square recess on the upward side of the lower block is aligned with a square recess on the downward side of the upper block, and conversely each circular hole on the upward side of the lower block is aligned with each corresponding circular hole on the downward side of the upper block, nut means fitting into the conically tapered section of each bore, bolt means connecting the nut means in each vertically adjacent and aligned pair of circular holes to hold the blocks in vertical stability, and wedge means fitting into each vertically aligned pair of adjacent square recesses to hold the blocks in lateral stability.

Throughout the remainder of the specification and claims the term "block" is intended to cover any precast concrete element of the present invention whether in the form of a pad or footer, a wall forming block, a beam, or a floor element. However, sometimes for the sake of greater clarity an adjective may be used with block.

For a better understanding of the invention reference should be had to the accompanying drawings, wherein:

FIGURE 1 is an exploded perspective view of the footer blocks utilized as a foundation in the block construction of the invention;

FIGURE 2 is partially vertically sectioned, exploded and enlarged fragmentary perspective view of the wall forming block construction utilized in the invention;

FIGURE 3 is a partially vertically sectional, fragmentary, perspective view of a wall construction utilizing the footer blocks of FIGURE 1, and the wall-forming blocks of FIGURE 2;

FIGURE 4 is an enlarged, fragmentary, vertical cross-sectional, perspective view showing the bolt means utilized to hold the wall-forming blocks together for vertical stability in construction;

FIGURE 5 is an enlarged, fragmentary, vertical cross-sectional, perspective view similar to FIGURE 4 but showing the bolt and wedge means holding the footer blocks together as well as the bolt means holding the wall-forming blocks to the footer blocks;

FIGURE 6 is an enlarged, exploded, perspective view, of the bolt and nut means of FIGURES 4 and 5;

FIGURE 7 is a partially vertically sectional, fragmentary, perspective view of an upper wall section showing floor girder blocks and flooring blocks on top of the girder blocks;

FIGURE 8 is an enlarged, fragmentary, vertical cross-sectional, perspective view of the bolt means used to hold the flooring blocks to the girder blocks as shown in FIGURE 7; and

FIGURE 9 is a vertical cross sectional view of the footer blocks taken on the line 9—9 of FIGURE 1.

Although the principles of the invention are broadly applicable to block forms and shapes as shown and adaptable for any specific type of construction, the invention is usually employed in the form of wall forming blocks having a thickness of one module or eight inches,

a height of a plurality of modules, usually two modules or sixteen inches, and a plurality of desired module lengths, for example, any multiple of eight inches. The footer blocks will typically be one-half module or four inches thick, and in module rectangles or preferably squares, for example, three by three modules, and five by five modules.

With specific reference to the form of the invention illustrated in the drawings, and particularly with reference to FIGURE 3, the invention contemplates the use of a plurality of wall-forming blocks, indicated generally by letter W, which blocks are generally made from preformed concrete in a manner similar to the formation of conventional concrete blocks. The invention contemplates that the blocks W be generally rectangular in shape having uniform widths and heights, such as previously stated, but varying in module length to facilitate construction therewith. The blocks W rest on small footer blocks indicated generally by the letter F3, resting on larger footer blocks, indicated generally by the letter F5. The block F3 is three modules square and the block F5 is five modules square.

The term "module" as herein employed is intended to cover a dimension taken up by one bore or hole H, as hereinafter described and is typically eight inches.

One of the features of the utility of the invention relates to the wedging and bolt means used to hold the various blocks together. The bolting and wedging action is dependent on the bores or holes, indicated generally by letter H, as shown in various views but most clearly seen, in FIGURE 2. Each hole H with the necessary material around it forms a module unit dimension of eight inches square in one best known form of the invention.

With reference to FIGURE 2, it should be noted that each hole H is molded square in cross section at T and slightly tapered longitudinally for ease in drawing core patterns. The larger end of hole H contains a square recessed portion R also formed longitudinally with a slight taper. The bore portion T terminates in a conically beveled shoulder C, terminating in a small circular hole D. The holes H are equally spaced, also at the module unit distance, and are alternately arranged as to upper ends, all on the longitudinal center lines of the blocks W as particularly shown in FIGURE 2. Therefore, the openings from each hole H are arranged to have a recessed portion R followed by a small circular hole D, followed by another recessed portion R, etc., all as particularly evident from FIGURE 2.

The wall-forming blocks W are designed to be placed in overlapping relation one on top of the other so that for vertically spaced courses of the blocks the circular holes D of one course are aligned with the holes D of an adjacent course. Similarly, recesses R are aligned. Thus, an aligned and adjacent pair of circular holes D appear as shown in FIGURE 4. With reference to FIGURE 4, conically shaped nuts S having slightly tapered cylindrical shanks are wedged into position so that they fit securely with one shoulder abutting on the conical shoulder C and the extended shank portion wedging into the circular holes D. A square headed bolt B is screwed into position as shown in FIGURE 4 to securely hold the adjacent aligned blocks W together. The invention contemplates that the circular holes D as well as the nut shanks be slightly tapered to assist core pattern draw and the wedging action of the nuts S in order to hold the nuts S in position against slipping while the bolt B is being screwed tightly into place. Further the nut shanks can be formed with one or more ribs (not shown) to additionally hold the nuts against turning.

In order to insure a weather proofed wall a strip or strips of tar or weather proofing WP may be positioned between the aligned horizontal edges of the blocks W as shown in FIGURE 4, and vertical slots, as best seen in FIGURES 3 and 7, are provided at the end of each block which may be filled with tar or other suitable weather proofing material.

The application of the bolts B and nuts S in relation to the footers F is best seen in FIGURE 5. Note that the bores H through the footer blocks do not contain an elongated square section T, as is contained in the wall-forming blocks W, since the height or thickness of the footer blocks is much smaller, being typically four inches.

In order to further assist in strengthening the construction of the building, and particularly to maintain all parts in lateral stability, a key or wedge G is provided to fit into at least certain or all of the adjacent aligned square recesses R of the bores H, all as clearly shown in various figures and specifically FIGURE 5. In the preferred embodiment of the invention, the square recesses R are slightly tapered, as aforesaid, so that the wedges G, also slightly tapered, are securely wedged into place providing the proper lateral stability and strengthening features desired. An enlarged wedge G exploded from the square recess R is shown in FIGURE 2. A plurality of wedges G are shown in position, in FIGURE 3, ready to receive the square recess R of a block W to be placed on top in the next course of blocks. The wedges G also function during construction to align nuts S whereby installation of bolts B is facilitated.

FIGURE 7 shows how the invention provides, if required in a given building, rigid beam blocks RB having strengthening rods I therein. The beam blocks are built into the block wall to form floor beams typically two modules high, one module thick and any multiple long. Floor blocks RD, typically one half module or four inches thick, are mounted on the beam blocks RB using similar bolt means as described heretofore. However, in this modification the nut S*a*, as shown in FIGURE 8, is molded into or formed as a part of the beam blocks RB, and the RB, and the bolts B*a* have rounded heads and fit into round bores through the floor D, all as clearly shown in FIGURE 8. Also, it should be noted in this modification that the ends of each beam block RB has the standard bore H so that it can be attached to the wall blocks W by bolts and wedges as explained heretofore.

The invention contemplates that the various blocks be cast or formed in conventional manner and have surfaces similar to conventional concrete blocks. However, the blocks can be made to have any desired artistic outer or inner surface to form a wall construction with the surfaces as desired. Further, the blocks are usually formed of a size that can readily be handled so that construction is facilitated. As becomes obvious from the description heretofore, it is not necessary to employ highly skilled labor for building construction utilizing the blocks of the invention, as no mortar is necessary and therefore the construction is very simple and expedient. The finished building does not have the appearance of a conventional concrete block building, has no mortar joints and is much stronger.

The method of assembly of the blocks of the invention should be apparent from the foregoing description. Suffice it to say here that after the foundation has been dug suitable footer blocks are selected of a size to adequately carry the weight of the building. The F5 footer blocks are selected and nuts S are tamped into marked holes from the bottom. The F5 blocks are then positioned. Wedges G are now positioned in the F5 blocks and the F3 blocks also provided with bottom nuts S are placed on the F5 blocks and bolted in place. Next the selected wall blocks W are provided with nuts S in holes C and after placing wedges G in the squares R of the F3 blocks the wall blocks are bolted to the F3 footer blocks. Now the walls are readily built up by a continuation of the same procedure with weather stripping between the courses and between the ends of the blocks with any window or door openings being provided

as well as any floors and to the shape and contour desired.

Although the wedges G have been described as being made from concrete and the bolts B and nuts S have been described as being made from metal, the invention preferably makes these parts from a high strength plastic to enhance the corrosion resistant properties of the structure.

It will be recognized that the objects of the invention have been achieved by providing unique blocks adapted for building construction whereby the blocks can be easily secured in the vertical and horizontal directions to give a much sturdier and more effective wall construction, and wherein an entire building from foundation to roof can be constructed utilizing the principles of the invention. Further, this high strength construction of pleasing appearance can be made by relatively unskilled labor in a very short period of time.

While in accordance with the patent statutes one best known embodiment of the invention has been illustrated and described in detail, it is to be particularly understood that the invention is not limited thereto or thereby, but that the inventive scope is defined in the appended claims.

What is claimed is:

1. In a concrete block building construction the combination of walls formed from a plurality of rectangular wall-building blocks, a foundation formed of a plurality of footer blocks and adapted to receive the bottom wall blocks, short, vertically extending bolt means securely holding the bottom wall blocks in vertical position on the footer blocks, wedge means securely holding the bottom wall blocks in horizontal position on the footer blocks, short, vertically extending bolt means securely holding vertically adjacent wall blocks in vertical position, wedge means securely holding adjacent vertical wall blocks in horizontal position, beam blocks, short, vertically extending bolt means securing the beam blocks to the wall blocks, floor blocks, and short, vertically extending bolt means securing the floor blocks to the beam blocks.

2. In a building construction the combination of a plurality of precast concrete blocks of rectangular shape, each block having a plurality of bores through the vertical height thereof with the bores being equally spaced along the longitudinal centerline of the blocks, each bore comprising a slightly tapered square recess on one end thereof, a slightly tapered square hole of less cross sectional area than the recess extending from the recess toward the other end of the bore, a sharply tapered conically shaped inwardly directly recess formed at the end of the square hole opposite the square recess, and a circular hole extending from the bottom of the conically shaped recess to the other end of the bore to thereby complete the bore, said bores being arranged alternately so that if one bore has the square recess upwardly the next bore has the circular hole upwardly, each vertically adjacent block having their bores arranged so that each square recess on the upward side of the lower block is aligned with a square recess on the downward side of the upper block, and correspondingly each circular hole on the upward side of the lower block is aligned with a circular hole on the downward side of the upper block, plastic nut means wedged into the conically tapered recess and circular hole of each bore, relatively short plastic bolt means connecting the nut means in each vertically adjacent and aligned pair of circular holes to hold the blocks in vertical stability, and square block-shaped concrete wedge means wedged into each vertically adjacent and aligned pair of square recesses to hold the blocks in lateral stability.

3. In a building construction having the strength of monolithically cast concrete the combination of a plurality of precast concrete blocks of rectangular shape, each block having a plurality of bores through the vertical height thereof with the bores being equally spaced along the longitudinal centerline of the blocks, each bore having a recess on one end and narrowing to a circular hole on the opposite end, said bores being arranged alternately so that if one bore has the recess upwardly the next bore has the circular hole upwardly, each vertically adjacent block having their bores arranged so that each recess on the upward side of the lower block is aligned with a recess on the downward side of the upper block, and correspondingly each circular hole on the upward side of the lower block is aligned with a circular hole on the downward side of the upper block, nut means wedged into the circular hole of each bore, bolt means connecting the nut means in each vertically adjacent and aligned pair of circular holes to hold the blocks in vertical stability, and concrete block wedge means wedged into each vertically adjacent and aligned pair of recesses to hold the blocks in lateral stability.

4. In a building construction the combination of a plurality of preformed concrete footer members, a plurality of rectangularly shaped preformed concrete block members adapted to rest on the footer members as a foundation, said block members forming walls when laid end to end in courses on top of each other, a plurality of pre-formed concrete rigid beam members having reinforcement rods therein resting on the top of the walls to form floor girders, a pre-formed concrete floor member resting on top of the beams, nut and concrete block wedge means removably carried by each footer, block, beam and floor member, relatively short bolt means connecting the nut means in each vertically adjacent pair of members to insure vertical stability, the bolt means extending only a short distance into the adjacent pair of members connected, and the wedge means wedging each vertically adjacent pair of members to insure horizontal stability.

5. A concrete block building including footer blocks and wall blocks, all blocks having a length, width and height, equal to a multiple of a module unit each block having a vertical bore centrally positioned in each module length and width, means at one end of each bore adapted to receive a nut, means at the other end of each bore adapted to receive a key, alternate bores being inverted so that one bore has its key receiving means upwardly and the next has its key receiving means downwardly, removable concrete keys in at least certain of the bores of the footer blocks received in the bores of the lower course of wall blocks, removable concrete keys positioned in the bores between adjacent courses of the wall blocks, nuts carried in the bores of at least certain of the footer blocks, nuts carried in the opposed bores of the lower course of wall blocks, relatively short bolts joining the nuts of the footer blocks and the wall blocks, nuts in opposed bores of wall blocks forming adjacent wall courses, and relatively short bolts joining the nuts of the wall blocks forming adjacent courses.

6. A concrete block building having substantially the strength of monolithically cast concrete including wall blocks, all blocks having a length, width and height, equal to a multiple of a module unit, each block having a vertical bore centrally positioned in each module length and width, means at one end of each bore adapted to receive a nut, means at the other end of each bore adapted to receive a removable concrete key, alternate bores being inverted so that one bore has its key receiving means upwardly and the next has its key receiving means downwardly, removable concrete keys positioned in the bores between adjacent courses of the wall blocks, nuts in opposed bores of wall blocks forming adjacent wall courses, and short bolts joining the nuts of the wall blocks forming adjacent courses.

7. The combination defined in claim 6 wherein weather stripping is provided between adjacent block courses, and wherein the nuts are positioned in the blocks in ad-

jacent ends of opposed bores whereby the bolts joining adjacent block courses can be relatively short.

8. In a building construction the combination of a plurality of precast concrete blocks of rectangular shape, each block having a plurality of bores through the vertical height thereof with the bores being equally spaced along the longitudinal centerline of the blocks, each bore comprising a slightly tapered square hole on one end thereof, a conically shaped inwardly directed recess formed at the inner end of the square hole, and a circular hole extending from the other end of the conically shaped recess to the other end of the bore to thereby complete the bore, said bores being arranged alternately so that if one bore has the square hole upwardly, the next bore has the circular hole upwardly, each vertically adjacent block having their bores arranged so that each square hole on the upward side of the lower block is aligned with a square hole on the downward side of the upper block, and correspondingly each circular hole on the upward side of the lower block is aligned with a circular hole on the downward side of the upper block, nut means wedged into the conically tapered recess and circular hole of each bore, bolt means connecting the nut means in each vertically adjacent and aligned pair of circular holes to hold the blocks in vertical stability, and wedge means wedged into each vertically adjacent and aligned pair of square holes to hold the blocks in lateral stabilty.

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FRANK L. ABBOTT, *Primary Examiner.*

HENRY C. SUTHERLAND, *Examiner.*

J. L. RIDGILL, *Assistant Examiner.*