Nov. 9, 1971 T. F. SEASE 3,618,279

BUILDING BLOCK

Original Filed Feb. 24, 1969 2 Sheets-Sheet 1

FIG-1

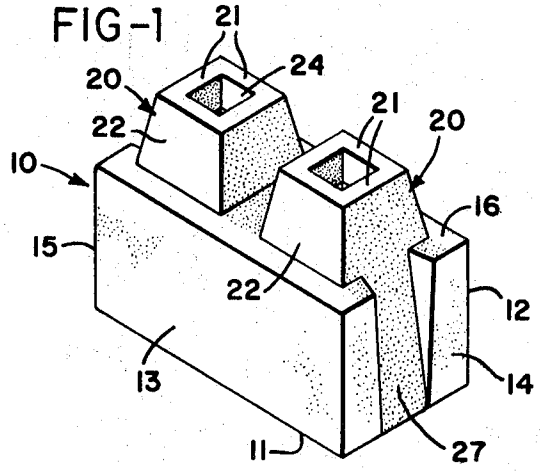


FIG-2

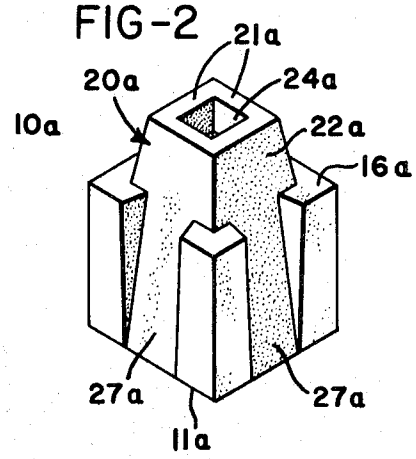


FIG-3

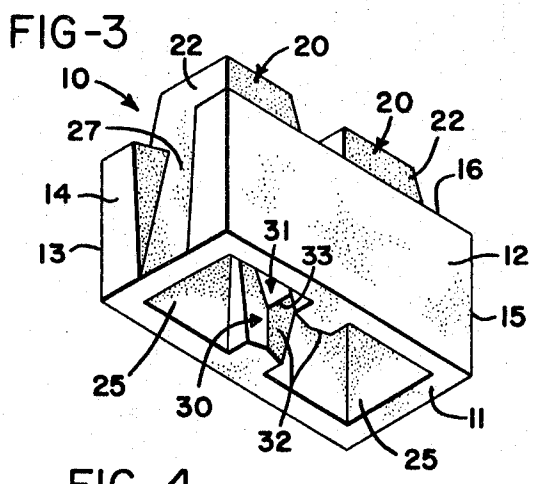
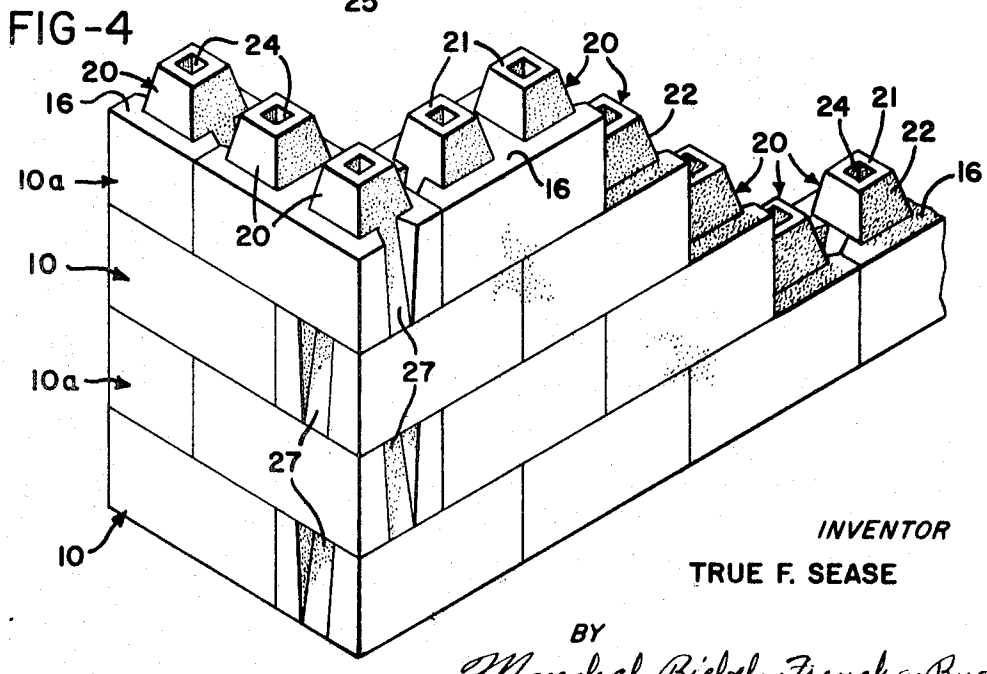


FIG-4



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BUILDING BLOCK

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FIG-5

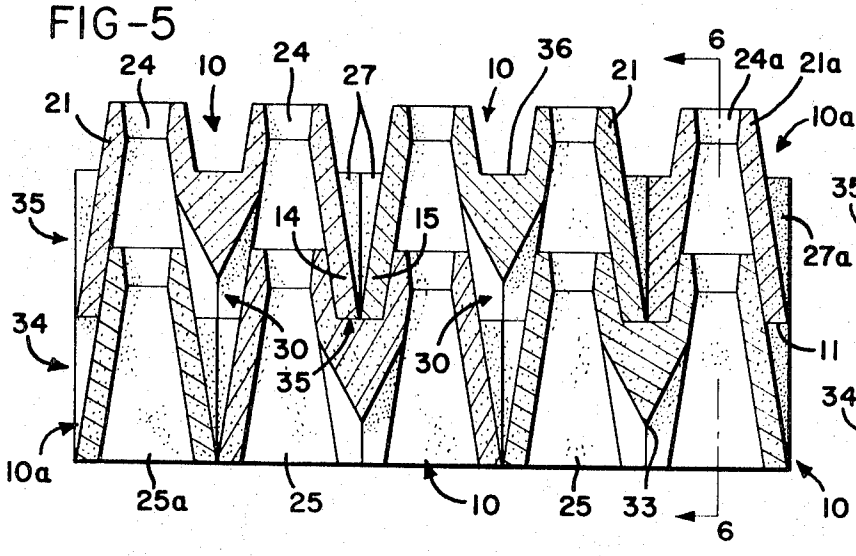


FIG-6

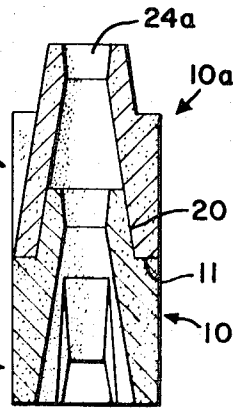


FIG-7

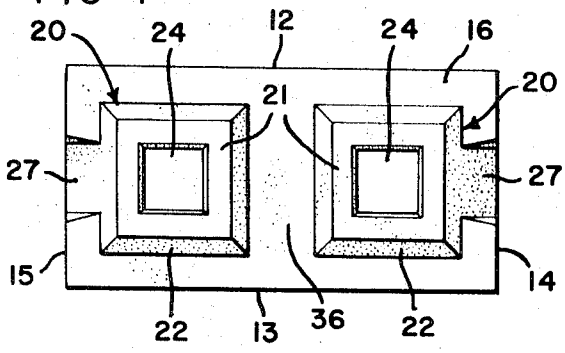


FIG-8

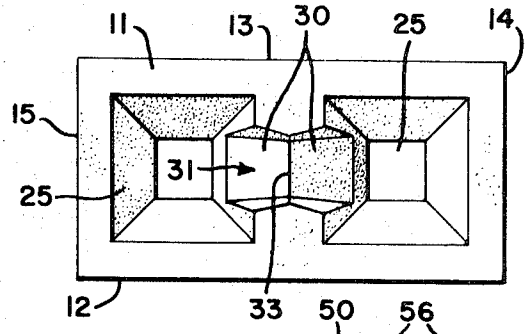


FIG-9

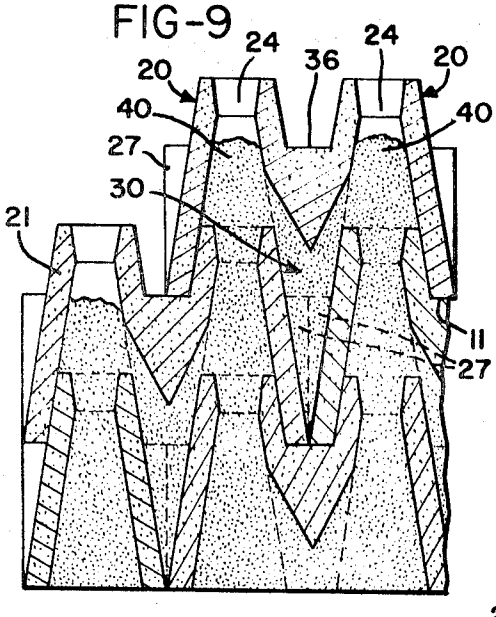


FIG-10

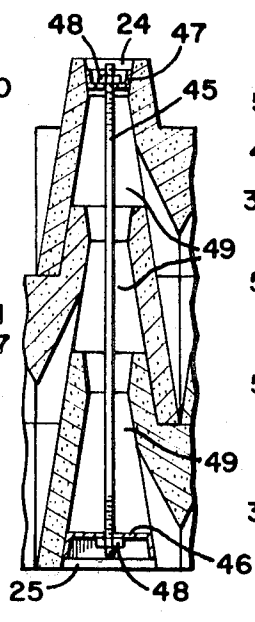
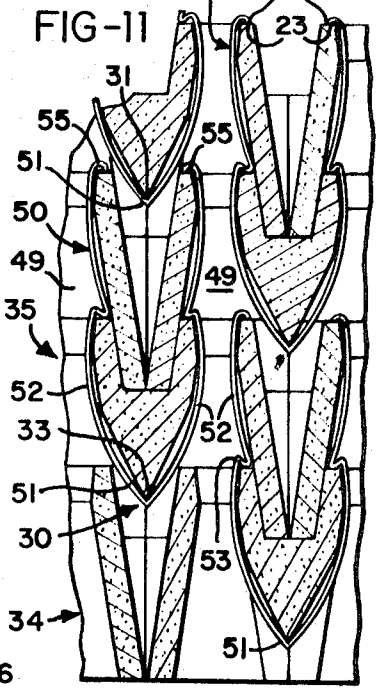


FIG-11



United States Patent Office 3,618,279
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3,618,279

BUILDING BLOCK

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Continuation of application Ser. No. 801,437, Feb. 24, 1969. This application Oct. 26, 1970, Ser. No. 84,189
Int. Cl. E04b 2/20; E04c 1/10
U.S. Cl. 52—227 10 Claims

ABSTRACT OF THE DISCLOSURE

A building block having male and female portions adapted to hold a series of blocks in interconnecting relation, with or without the use of mortar, which can be established with a minimum requirement of labor skill in a minimum of time. Each block includes a body having substantially flat top and bottom surfaces with vertical sides and having hollow truncated pyramidal projections of rectangular cross sections extending through the central portion of the block from the bottom wall to a position substantially equal to one half the height of the body and a cavity within the body which extends upwardly from the bottom surface to receive one of the projections from a lower course of blocks. A tie rod, a wire clip, or tie cables may also be used to hold the blocks in place.

This is a continuation of my copending application Ser. No. 801,437, filed Feb. 24, 1969, and now abandoned.

BACKGROUND OF THE INVENTION

Building blocks having male and female interlocking members have been used for some time in an attempt to reduce the amount of labor required to construct walls, as well as to provide a stronger wall once the blocks were assembled. Many of these blocks use some arrangement of tongue and groove, dovetail, sliding spline, or other male and female members and they suffer from the disadvantage that they are difficult to manufacture to the tolerances required and that they must be clean when being assembled, otherwise the blocks will not interlock successfully.

SUMMARY OF THE INVENTION

This invention relates to an interlocking building block which is not subject to the above listed disadvantages and which may be quickly and easily molded from a wide range of materials. The blocks formed according to this invention, when in use, naturally force themselves into accurate alignment as the next course of blocks is laid upon a lower course. These blocks are so constructed that they interlock in single or multithickness walls and corners, and can be made to form buttresses in walls, without the need for specially designed blocks.

Interlocking types of blocks are particularly useful in emergency building and repair projects, especially in cold weather, and rain, under water, or other adverse conditions where the use of mortar may be impractical. For example, these blocks may be used in the building and repair of dams, bridges, roads, airstrips, bunkers, retaining walls, and the like. Moreover, if they are not permanently fastened together, they can be quickly and easily disassembled and used again.

The building blocks constructed according to this invention include a body having substantially parallel flat top and bottom surfaces with vertical side walls and include at least one truncated pyramidal projection which extends from the bottom wall upwardly to a position approximately equal to one-half the height of the body. These projections are hollow and are adapted to receive the projections from a lower course of blocks. The number of these projections in any one block may vary.

The body may be provided at its ends with tapered slots which facilitate the interconnecting of the blocks. In a multiple projection block, the cavities within the block are formed so that, when laid in place, mortar may extend horizontally across the block and thus facilitate holding courses of blocks together.

Several methods of holding the blocks together may be employed, including but not limited to frictional engagement, an adhesive material such as epoxy, a releasable clip which may extend through adjacent sections to hold one course of blocks against the next adjacent vertical block, a tie rod or cable extending through the hollow sections or a tie cable. If mortar is used, the blocks will be vertical and horizontally interconnected into a permanent wall.

Accordingly, it is an object of this invention to provide an improved interlocking type of building block of the type described having a hollow truncated pyramidal projection extending upwardly from the body of the block, and a cavity within a block so formed as to receive such a projection from a block in an adjacent lower course, such a block being designed so that it is easily manufactured without requiring close tolerances; to provide an interlocking block of the type described wherein a block may include a plurality of hollow truncated pyramidal projections and wherein the cavity within the block is so designed that when filled with mortar it will permit horizontal as well as vertical interconnection among the courses of blocks; and to provide an improved interlocking building block of the type described which may be assembled without the use of mortar and which may be fastened together by means such as clips, tie rods or tie cables.

Other objects and advantages of the invention will be apparent from the following description, the accompanying drawings, and the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a double projection embodiment of the building block in accordance with the invention;

FIG. 2 is a perspective view of a single projection block in accordance with the invention;

FIG. 3 is a perspective view of the block shown in FIG. 1 showing the lower portion thereof;

FIG. 4 is a perspective view of a wall constructed with the blocks;

FIG. 5 is a sectional view taken centrally through a portion of a wall which has been formed from the blocks;

FIG. 6 is a sectional view taken along the lines **6—6** of FIG. 5;

FIG. 7 is a top view of the block shown in FIG. 1;

FIG. 8 is a bottom view of a block shown in FIG. 1;

FIG. 9 is a sectional view taken centrally through a wall showing mortar interconnecting the blocks together;

FIG. 10 is a sectional view showing a tie rod utilized to interconnect the blocks; and

FIG. 11 is another sectional view showing a removable clip securing the blocks together.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Each of the blocks **10** constructed in accordance with the invention has a substantially flat bottom surface **11**, vertical side walls **12** and **13**, end walls **14** and **15**, and a substantially flat top surface **16**, as shown in FIGS. 1 and 3. Each block includes at least one projection **20** formed integrally of the block **10**. This projection is a hollow truncated pyramidal projection **20** which includes upwardly tapering walls **21** and outer surface **22**. These

projections, for all practical purposes, extend from the top **16** of the block to a distance substantially one-half the distance between the bottom **11** and the top **16**.

The interior of the block and the upwardly extending projection is hollow, and each projection is provided with a top opening **24** and a larger bottom opening **25**. The opening or cavity **25** has a truncated pyramidal configuration conforming to the external configuration of the projection **20** and extends upwardly into the projection, as shown in FIG. 5. The opening **24** is an inverted truncated pyramidal cavity and forms an extension of the cavity **25**.

A slot **27** is formed in each of the end walls **14** and **15** of the block shown in FIGS. 1 and 3. The slots **27** extend upwardly in the same plane as the outer surface **22** of the projections so that, as seen in the cross sectional view of FIG. 5, the walls **21** have substantially uniform thickness from the bottom surface **11** to the opening **24**. The width of this slot **27** is uniform and is adapted to mate with a similar slot in an adjacent block to facilitate horizontal interconnection of the blocks, as will be seen. The slot **27** is therefore an outwardly facing cavity having a depth which progressively increases from the bottom surface toward the top surface.

In those blocks employing more than one projection, such as shown in FIG. 3, the adjacent openings **25** are interconnected by a slot **30** (FIG. 8) defined by the inwardly tapering walls **31** and the side walls **32** which terminate in an edge **33** substantially spaced above the bottom **11** of the block. The width of the slot **30** is generally uniform except that the walls **32** thereof are slightly tapered to facilitate the removal of the block from its molding apparatus.

The block **10** may also be constructed as a square block **10***a* having a single upper projection **20**, as shown in FIG. 2. If desired, although not essential, end slots **27***a*, may be provided in adjacent walls. In other respects the block **10***a* is identical to the block **10** shown in FIG. 1. Of course, no interconnecting slots between adjacent cavities are required in this embodiment.

If desired, it is possible to construct an elongated block with three, four or substantially any number of projections, the only factor limiting the length being handling and production costs.

The blocks **10** as described above may be formed from substantially any type of moldable material such as cement, slag, cinders, clay, plastics and the like.

Referring now to FIGS. 4 through 6, a plurality of double and single blocks **10** and **10***a* are shown assembled together in accordance with the invention. When so assembled, the projections from adjacent double blocks **10** in a lower course **34** are bridged by a single double block **10** in the upper course **35** thus interlocking the blocks to prevent sideways movement. As shown, the lower wall **11** of the blocks in the upper course rest on the top surface **16** of the blocks in the lower course. Once a wall is so assembled, only vertical movement of the course will be possibel since horizontal movement is prevented by the interlocking action.

As shown in FIG. 5, the slot **30** provides means for interconnection adjacent sections of the blocks when they are filled with mortar. Also, the slots **27** between adjacent blocks in a single horizontal course provide a means for locking these blocks together when this slot is filled with mortar. Access to the mated slots **27** is through one of the top openings **24**, and through the slot **30**.

The adjacent end walls of the blocks in an upper course are locked together since they are received in the space **36** between the projections in a block in the lower course. Stated another way, the lower portion of the walls **14** or **15** are locked between the upwardly extending projections **20** from the block in the next lower course.

Relative horizontal movement between the blocks is also prevented, as shown in FIG. 6, since the upwardly projecting portion of the block is received in the cavity in the block of the next upper course. As shown, the dimensions of the cavity are so formed as to receive the outer surface of the projection.

Thus, as the invention has been described, the blocks are prevented from relative horizontal movement due to the interlocking action between blocks in vertically adjacent courses. If it is desired to provide additional interconnection between the blocks to form a permanent or semi-permanent wall, mortar **40** or other similar material may be forced into the interior of the blocks through the openings **24** and into the slots **27**, as shown in FIG. 9. In this arrangement, the mortar forms a V-shaped connection between an upper block and the two adjacent lower blocks by filling the space through the opening in the interior of the projections and also by filling the space in the slot **30**. In this arrangement the mortar fills substantially all interior cavities making it substantially impossible to separate the blocks once the mortar has cured.

Another embodiment for fastening the blocks together is shown in FIG. 10 and includes a tie rod **45** extending from a plate **46** which is wedged into the opening **25** in the lowermost course of blocks. The tie rod is secured to an upper plate **47** similarly wedged in the opening **24** in the uppermost course of blocks. Nuts **48**, received onto threads formed in the tie rod, complete the connection. If desired, the plate **46** may be located in a footer below the lowermost course. By use of this arrangement, any number of courses of blocks may be secured together with the tie rods of appropriate length. A tie rod **45** may be used through each vertical stacking of the passages **49** or at spaced intervals suited to the strength requirements of the wall being constructed.

A similar embodiment for fastening the blocks together includes cables and cable fastening instead of tie rods and threaded nuts. Cables anchored to underwater bases would be particularly helpful in constructing underwater portions of dams, bridges, and the like, because the blocks could be strung like beads onto a cable from above the water level and lowered by gravity into place.

A further embodiment of means to interlock the blocks **10** together vertically includes the use of removable clips **50**, as shown in FIG. 11. Each clip **50** includes a V-shaped lower portion **51** adapted to seat against the slot edge **33**, and arms **52** curved upwardly so as to pass through openings **36** and adjacent passages **49** of the blocks **10**, and arm projections **53** adapted to engage and seat upon the tops **23** of the projections, thereby securing the clip in a firm upright position through the block **10** of the lower course. The arms **52** further extend upwardly and form loops **55** having ends **56**. These arm extensions are thus ready to be received through the passages **49** of the two adjacent blocks of the next upper course **35** to engage and seat on the tops **23** thereof.

Clips **50**, so inserted through the blocks **10** of the lower course **34**, engage and hold the blocks **10** in the adjacent upper course **35**, and similarly, clips **50** that are inserted in the blocks of the course **35** will engage and hold the blocks **10** in a further course, and so on. Once in place, the inward flexing of the clips **50** prevent vertical separation of the blocks of an upper course from the blocks in a lower course.

In addition to the means shown for fastening the blocks together, it is within the scope of the invention to use commercially available adhesives to interconnect the adjacent surfaces of the blocks **10** as they are stacked. Moreover, the blocks may be secured together by filling with mortar or other materials, such as plastic, pulp, or the like.

It is within the scope of this invention to construct a set of top course or cap blocks and also bottom course blocks which includes parts of the projections and cavities, if required for special application. It is also within the scope of this invention to construct blocks with additional projections to increase the length or the width of the blocks, within the limits of economy and convenience in

handling, to facilitate the construction of single or multi-thickness walls. It is further within the scope of this invention to construct a curved block for use in creating round walls and the like.

The blocks thus described can be utilized to construct permanent or temporary retaining walls, dams, dikes, docks, piers, bridges, buttresses, river channels for erosion and flood control, well linings, cisterns, swimming pools, silos, base walls for mobile homes or oil tanks, homes, garages, public buildings, warehouses, factories, fireplaces, chimneys, floors, driveways, rods, landing strips, bomb shelters, bunkers, ornamental screen walls, and the like. The blocks can be arranged in interlocking T-partitions, X-partitions, inverted V-arches and the like.

The block may be made on a miniature scale, if desired, to be used in constructing interlocking temporary or permanent architectural models.

While the forms of apparatus herein described constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to these precise forms of apparatus, and that changes may be made therein without departing from the scope of the invention.

What is claimed is:

1. An improved building block having a main body including:

a generally retangular cross-sectional configuration and parallel top and bottom surfaces defining a predetermined height,

at least two truncated pyramidal projections extending upwardly from said top surface of said body,

means defining an internal cavity within said body extending upwardly from said bottom surface into and through each said projection for receiving the projections of a lower adjacent block,

means defining a downwardly facing slot extending upwardly from said bottom surface and interconnecting said internal cavities, and

means defining a vertically extending and outwardly facing cavity within at least one end portion of said body, said outwardly facing cavity having a depth which progressively increases from said bottom surface toward said top surface.

2. A block as defined in claim **1** wherein each said internal cavity has a truncated pyramidal configuration conforming to the external configuration of said projections, with each said cavity extending upwardly into said projection.

3. A block as defined in claim **1** wherein said outwardly facing cavity is partly formed by a surface which extends upwardly from said body to form an outer surface of said projection.

4. A block as defined in claim **1** including means defining an inverted truncated pyramidal cavity within the upper end portion of each said projection and forming an extension of said internal cavities.

5. A plurality of said blocks as defined in claim **4** disposed in stacked relation with said projections of a lower said block extending upwardly into said cavities of an upper said block, and a mechanical clamping device extending through said cavities of the upper and lower said blocks to lock said blocks together.

6. A plurality of blocks as defined in claim **5** wherein said mechanical clamping device includes first plate means adapted to engage the walls of an inverted pyramidal cavity in the uppermost block, second plate means adapted to engage the walls of a cavity in the lowermost block, and tie rod means adapted to rigidly interconnect both said plate means.

7. A plurality of blocks as defined in claim **5** wherein said mechanical clamping device includes first plate means adapted to engage the walls of an inverted pyramidal cavity in the uppermost block, second plate means adapted to engage the walls of a cavity in the lowermost block, and cable means adapted to rigidly interconnect both said plate means.

8. A plurality of blocks as defined in claim **5** wherein said mechanical clamping device includes a clip having a lower portion adapted to seat against said downwardly facing slot and elongated arms which extend upwardly through adjacent passages of said block in a lower course, said arm having projections adapted to engage and seat upon the top surface of the projections of the blocks in an upper course.

9. A block as defined in claim **1** wherein said pyramidal projections extend upwardly from said top surface by a distance substantially equal to one-half the height of said body.

10. A plurality of improved building blocks each block comprising:

a main body having a generally rectangular cross-sectional configuration and parallel top and bottom surfaces defining a predetermined height,

at least two truncated pyramidal projections extending upwardly from said top surface of said body by a distance substantially equal to one-half of said height of said body,

means defining a cavity within said body extending upwardly from said bottom surface into each projection for receiving one of said projections of a lower adjacent said block,

means defining a downwardly facing slot extending upwardly from said bottom surface and interconnecting said cavities,

said blocks disposed in stacked relation with said projection of a lower said block extending upwardly into said cavity of an upper said block, and

a mechanical clamping device extending through said cavities of the upper and lower said blocks to lock said blocks together,

said mechanical clamping device including a clip having a lower portion adapted to seat against said slot and elongated arms which extend upwardly through adjacent passages of said block in a lower course, said arms having projections adapted to engage and seat upon the top surface of the projections of the blocks in an upper course.

References Cited

UNITED STATES PATENTS

1,446,796	2/1923	Henderson	52—606 X
1,516,473	11/1924	Davis	52—591
1,630,698	5/1927	Florey	52—594
1,689,107	10/1928	Bradley	52—594
2,019,653	11/1935	Buyer	52—595
2,493,547	1/1950	Paolella	52—605
2,684,589	7/1954	Perreton	52—439 X
2,861,388	11/1958	Favaretto	52—594 X
3,305,982	2/1967	Steele	52—90
3,382,632	5/1968	Grofcsik	52—584 X

PRICE C. FAW, JR., Primary Examiner

U.S. Cl. X.R.

52—379, 439, 563, 594, 607