May 15, 1951 W. H. ELLIS 2,552,712

KEYED BUILDING BLOCK WALL

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FIG. 1.

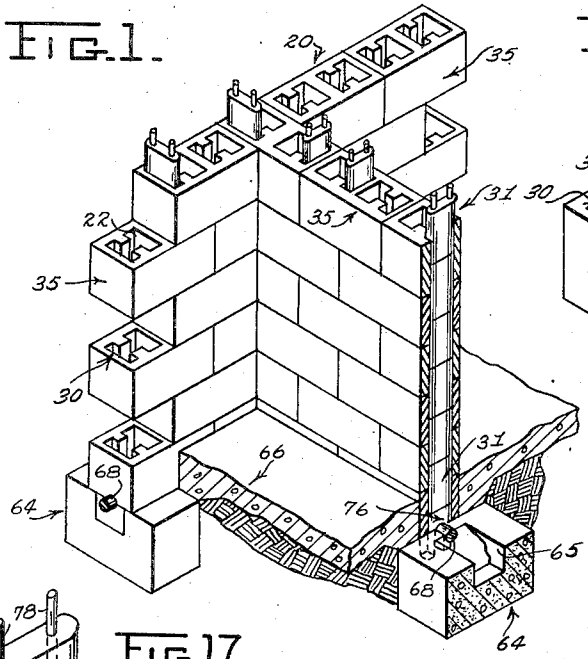


FIG. 6.

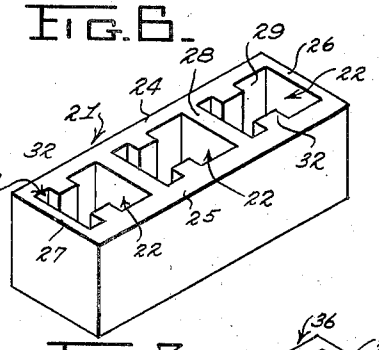
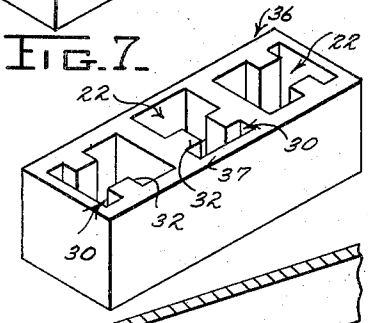


FIG. 7.



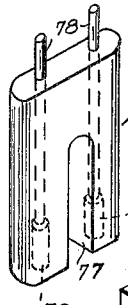


FIG. 17.

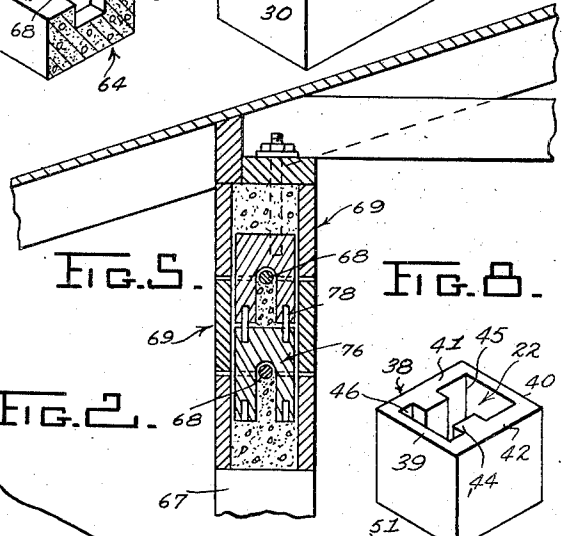


FIG. 5.

FIG. 8.

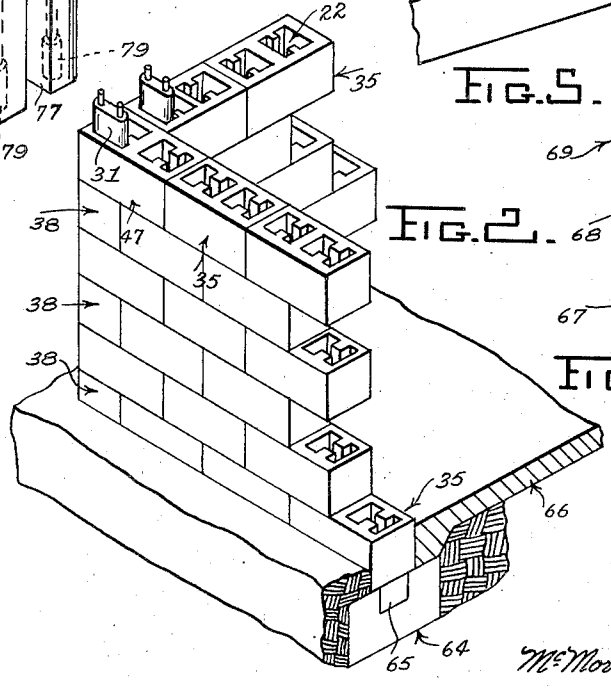
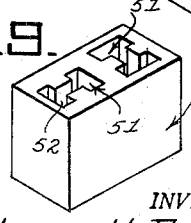


FIG. 2.

FIG. 9.



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FIG. 3.

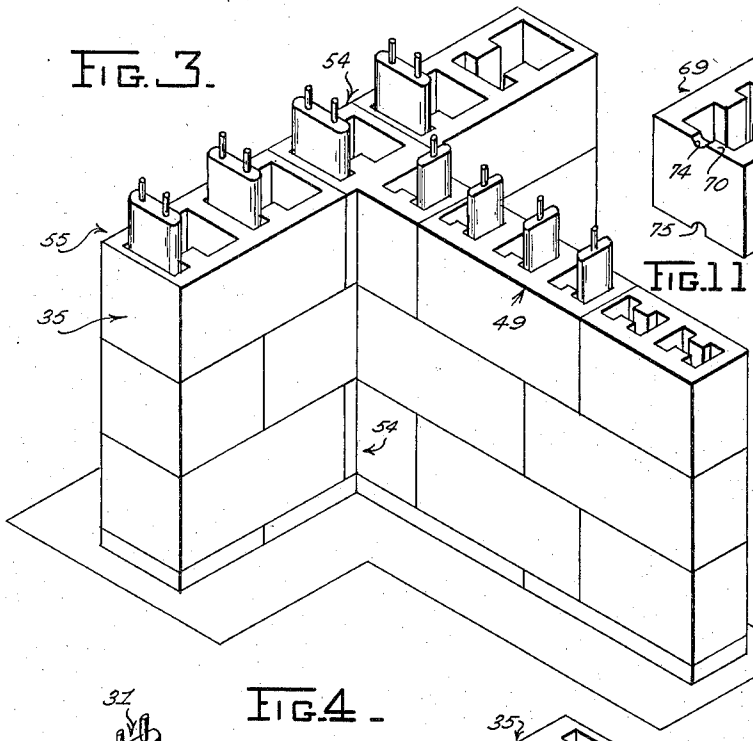


FIG. 4.

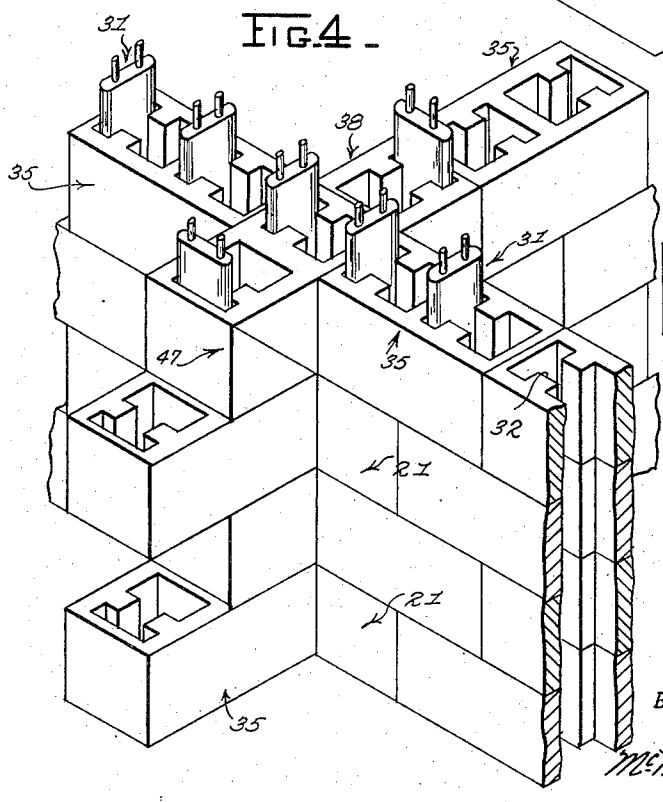


FIG. 10.

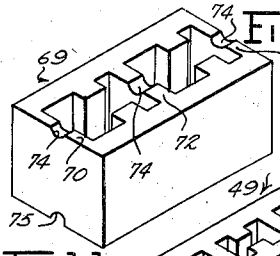


FIG. 11.

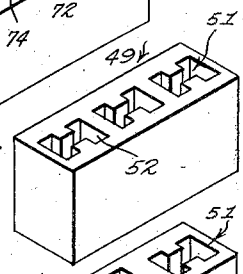


FIG. 12.

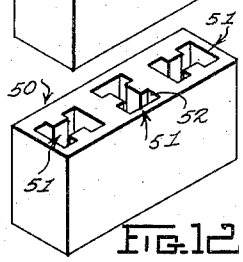


FIG. 13.

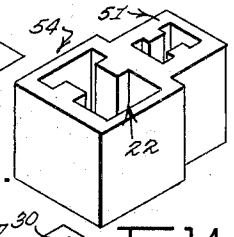


FIG. 14.

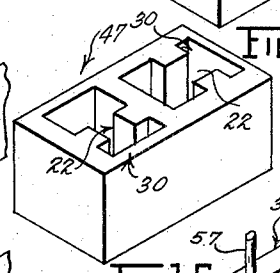


FIG. 15.

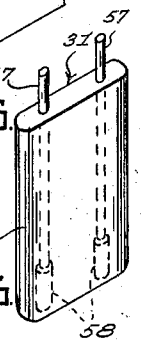


FIG. 16.

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KEYED BUILDING BLOCK WALL

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Application March 8, 1949, Serial No. 80,215

3 Claims. (Cl. 72—41)

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This invention relates to building blocks and more particularly to building blocks having a key locking means engaging therein for securing overlying courses of similar blocks together.

It is an object of this invention to provide a building block of the kind to be more particularly described hereinafter which is formed to be interlocked with overlying building blocks to provide smooth surfaced outer walls, rigidly secured together and having locking members engaging in the overlying blocks. The locking keys are formed with short lengths of metal rods for interlocking engagement with subadjacent keys in a manner to substantially provide for vertical metal reinforcement which is secured in the masonry structure as the progress of the structure is advanced. In this manner substantially prefabricated, building blocks may be assembled to various sized walls, partitions or buildings, the various side structures being formed of the same size building blocks.

Another object of this invention is to provide a building wall formed with light weight building blocks which are novel in structure and arrangement to provide for the erection of a masonry structure at appreciably reduced labor cost; having vertical reinforcing steel rods which are positioned at the time of laying the blocks to provide a rigid and solid structure.

With the formation of a building block in the manner herein described, the cost of fabricating a building wall is appreciably lessened from the present standards of building cost as the usual free air space in such blocks is utilized for engaging the locking key and reinforced securing means for adjacent blocks, leaving the outer surfaces of the block without a break.

With the above and other objects in view, my invention consists in the arrangement, combination and details of construction disclosed in the drawings and specification, and then more particularly pointed out in the appended claims.

In the drawings:

Figure 1 is a perspective view, partly broken away, and partly in section of the intersection of a partition with an outer wall, the partition and outer wall being formed with building blocks constructed according to an embodiment of my invention.

Figure 2 is a perspective view, partly broken away, and partly in section, of a corner formed by the engagement of outer side walls.

Figure 3 is a perspective view, partly broken away and partly in section, of the intersection of a partition with an outer wall, the partition being

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formed of building blocks smaller than the building blocks of the outer wall.

Figure 4 is a perspective view, partly broken away and partly in section, showing the intersection of a pair of partitions or inner walls.

Figure 5 is a transverse section, partly broken away, of building blocks disposed above the openings, as the window or door openings in a building having walls formed with building blocks of this invention.

Figure 6 is a perspective view of a large three unit building block constructed according to an embodiment of this invention.

Figure 7 is a perspective view of a large size building block formed for engagement with an intersecting wall or partition.

Figure 8 is a perspective view of a one unit, large size building block.

Figure 9 is a perspective view of a narrow building block formed for the engagement of corner walls.

Figure 10 is a perspective view of a two unit, large size building block, formed for engagement of a reinforcing rod within the wall.

Figure 11 is a perspective view of a three unit narrow building block.

Figure 12 is a perspective view of a narrow size building block formed for engagement with an intersecting building block.

Figure 13 is a perspective view of a reducing block for securing the intersection of a large or wide block with a wall or partition formed with narrow blocks.

Figure 14 is a perspective view of a large size corner building block.

Figure 15 is a perspective view of a building block locking key, particularly designed for the small size building blocks.

Figure 16 is a perspective view of the large size locking key for the large building blocks.

Figure 17 is a perspective view of a modified locking key for use in walls formed with transverse reinforcing rods.

Referring to the drawings, the numeral 20 designates generally the outer wall of a building formed of building blocks constructed according to an embodiment of this invention. The building blocks 21 are formed of concrete or other suitable material and are generally substantially rectangular in configuration. The blocks 21 are formed with vertically opening passages therein which define units or cells, and various sized building blocks 21 may be employed, certain sizes embodying more or less number of cells than others.

In Figure 6 there is shown a standard form of large sized building block having three units. Each of the units 22 of the building block 21 comprises the side walls 24 and 25 of the block 21 and is closed on the ends by the end walls 26 and 27 or by one end wall and an intermediate partition or wall 28. Each of the units 22 is defined by the void 29 or vertical opening through the block between adjacent end walls or an end wall and an intermediate partition.

A portion of each cell 22 of the building block 21 is formed with a guide channel 30 within which a locking key 31 may be engaged.

The guide channel 30 is defined by the space between one of the end walls or intermediate partitions and a pair of inwardly extending confronting beads or lugs 32.

The guide channel 30 is defined by the space between one of the end walls or intermediate partitions and a pair of inwardly extending confronting beads or lugs 32. Most of the blocks 21 which define a building wall or partition are formed of blocks having transverse key receiving channels 30 therein and in these blocks 21 the lugs or ribs 32 are formed integral with the side walls 24 and 25. The ribs 32 are spaced apart transversely of the block 21 and longitudinally from the adjacent wall or partition. In Figure 6, the building block 21 is formed with three of the unit cells 22 therein and other building blocks, as building blocks 35 having two of the cell units 22, are shown as forming the outer walls and partition in Figure 1.

In Figure 7 there is shown a building block 36 formed for connecting together intersecting walls or partitions. The building block 36 is formed with a pair of longitudinally disposed cells 22, at the opposite ends thereof disposed in substantially the same manner as the longitudinally disposed cells 22 of the building block 21, shown in Figure 6. The center unit 22 in the building block 36 is disposed transversely thereof, normal to the alignment of the endmost cells. With the disposition of the center cell 22 at right angles to the endmost cells in Figure 7, the key receiving channel 30 is disposed longitudinally of the block, substantially parallel to one of the side walls 37 thereof. In all other manners the building block 36 is formed substantially the same as the building block 21, described above.

In Figure 8 there is shown a single unit building block 38 having a single cell 22 therein. The use of a building block 38 provides for the filling in of corners or spaces resulting from the offset, overlying engagement of building blocks having multiple units, as at the corners or partitions where only a single unit is required. The single unit block 38 is formed with end walls 39 and 40 connected together by side walls 41 and 42. Inwardly extending beads or lugs 44 are fixed to or formed integral with the side walls 41 and 42 in substantially the same manner as the inwardly extending beads 32 of the building block 21. The outer walls of the cell or block 38, together with the beads 44 define a unit 22 having a void 45 at one end thereof and a channel 46 at the other end, on the opposite side of the beads 44, defining a single cell or unit 22 which may be positioned in any selected relation to the disposition of an adjacent building block.

In Figure 14, there is shown a building block 47 having a pair of cells or units 22 disposed at right angles to each other. The building block 47 is formed as a part of the building block 36 described above, for use at corners or intersections of walls or panels formed with building blocks of this invention. In the block 47 one of the channels 30 is disposed normal to the length of the channel 30 of the adjacent cell 22.

In Figures 9, 11 and 12 there is shown a smaller type of building block formed in substantially the same manner as the building block described above and particularly designed for inside partition or building walls. In the preferred embodiment of the narrow type of building blocks 48, 49, and 50 the blocks are formed with openings or cell units 51 formed in substantially the same manner as the cells or units 22 of the wider or larger size blocks. In Figure 9 the block 48 is formed with rightangularly disposed units 51 for corner connections or intersecting connections of building walls or partitions. In Figure 11 the building block 49 is formed with a plurality of cells 51 therein the cells or units 51 being disposed in alignment with the length of the blocks having the channels 52 thereof disposed transversely of the blocks. In the block 50, shown in Figure 12 of the drawings, one of the cell units 51, as the middle unit, is turned at right angles to the end cells to provide for the engagement of intersecting walls in substantially the same manner as the building block 36 described above.

In Figure 13 the building block 54 is formed with one enlarged or wide cell unit 22 at one end thereof and a reduced or narrow cell unit 51 at the other end. The reducing block 54 is particularly designed for engagement of an outer wall with an inner wall or partition. As the inner walls or partitions are generally of a more narrow width than the outer walls, a reducing block 54 of this type provides for the fixed connection of such intersecting walls. As noted above, in the formation of the building blocks and the disposition of the cell units therein, at intersectons of building blocks or walls the cell units are disposed normal to each other. The particular disposition of the reducing block 54, in its use with intersecting walls or panels is clearly shown in Figure 3 of the drawings wherein the outer wall 55 is generally formed with building blocks 35 of the larger size, while the intersecting inner wall is generally formed with the narrow type of block as noted by the block 49 described above. The inner, narrow wall extends inwardly from the outer wall 55 in alignment with the narrow section 51 of the reducing block 54, while the outer wall 55 extends in alignment with the cell unit 22 on opposite sides of the reducing block 54.

For connecting the larger size building blocks, as the building blocks 21 and 36 together, I have provided a connecting key or key member 31 which is adapted to be slidably engaged in the channels 30 therein. The key member 31 is formed of a body 56 which is preferably made of concrete or other suitable material. A pair of longitudinally spaced apart metal rods 57 are embedded in the concrete body 56 and extend upwardly from one end thereof. The lower end of the bodies 56 are formed with downwardly opening recesses or bores 58 therein which are adapted to receive the upwardly extending rods 57 of a subadjacent key member 31.

For use with the narrow type of building blocks, I have provided a connecting key mmeber 59 having a body 60 and an upwardly extending reinforcing rod 61 secured therein. The rod 61 in the body 60 is disposed relative thereto in substantially the same manner as the rods 57 in the body 56. The body 60 is formed with a down-

wardly opening recess 62 in the bottom end thereof within which the upper end of the upwardly extending rod 61 of a subadjacent key member 59 may be securely engaged. The key 59 is particularly adapted to be secured in the channel 52 of the narrow type of building blocks, as the building blocks 48, 49 and 50 shown in Figures 9, 11 and 12 of the drawings.

In the use of the building blocks described above, to provide for the secure formation of the walls, the footings 64 are formed of concrete and are provided with longitudinally extending grooves or chases on the upper side thereof. The upwardly opening chase 65 in the footers 64 is of substantially the same width as the key members 31, as the lowermost of the key members are adapted to be engaged within the footing 64 and to be anchored in the chase 65. In the formation of the building wall 20, shown in Figure 1, the lowermost course of building blocks is supported on the upper surface of the footing 64 and the key members 31, which engage in the channels or guides 30 of the building blocks extend partway down into the chase 65. Half of the key member 31 is disposed within the chase while the upper half of the key is disposed within the channel 30 of the overlying building block. Normally the key members 31 are disposed with the rods 57 extending upwardly from the upper end thereof. This disposition is clearly shown in Figure 1 of the drawings, wherein it is noted that the overlying courses of the building blocks are so disposed that the keys 31 provide a substantial column or post for securing the wall together. When the lowermost or bottom course of blocks is engaged or positioned on the footing 64 the keys 31 of the lower blocks are engaged therethrough and the chase 65 is fully grouted to provide for the secure fastening and engagement of the key members therein. Then the lowermost building blocks are fully grouted or submerged within a layer of concrete which extends substantially over the full width and length of the side walls thereof. By substantially submerging the lowermost course of building blocks within a base 66, a firm and stable anchor and securing means is provided for the wall or building to be erected thereon.

As each further course of blocks is positioned over the lowermost course, the keys 31 are engaged in each of the blocks as it is positioned and then the channels 30 and the voids 29 in the same unit as the channels are filled with concrete or other suitable grouting material so that the overlying building blocks are securely mounted to the underlying course and to the base. By fully grouting the cells 22 within which the key members 31 are engaged, substantially concrete building posts are formed interiorly of the walls, the building posts being formed as the erection of the wall progresses.

In the formation of building walls having door or window openings therein, as the opening 67, noted in Figure 5 of the drawings, reinforcing rods must be employed in the connection of the building blocks above the opening. To provide for the disposition of the reinforcing rods 68 within the wall, in Figure 10 of the drawings there is shown a modified form of building block 69 wherein the end walls 70 and 71 and the intermediate walls, as the intermediate wall 72 are formed with longitudinally aligned recesses 74 and 75 on the upper and lower edges thereof.

When the building blocks 69 are positioned in course above the window opening 67 the longitudinally extending reinforcing rods 68 are seated in the upper recesses or grooves 74 before the locking keys are engaged between the blocks. In order to provide for the locking of the blocks 69 together in the same manner as the locking together of the blocks 21, the locking key 76 which is formed in substantially the same manner as the locking key 31, is formed with a downwardly opening groove or cut-out portion 77 so that the locking key 76 will substantially straddle the reinforcing rods 68. The locking key 76 is provided with upwardly extending reinforcing rods 78 on the upper end thereof and is formed with opening 79 on the lower end thereof within which the upper ends of the reinforcing rods or subadjacent locking keys may be securely engaged. The length of the reinforcing rods 68 may be such as to conform to the local building regulations for reinforcing the walls or openings of this kind, and will normally extend outwardly beyond the side edges of the openings a suitable distance to provide for a secure and firm connection of the building blocks over the opening.

I do not mean to confine myself to the exact details of construction herein disclosed, but claim all variations falling within the purview of the appended claims.

I claim:

1. A wall construction, comprising a footing provided in its top with a wide chase, horizontal layers of unitary hollow blocks arranged upon the footing, each block including sides and ends forming a main recess, the sides of each block having a pair of vertical opposed spaced ribs formed upon their inner faces for providing reduced passages between the ribs, key-slabs for each layer of blocks and having substantially the width of the main recesses of the blocks and inserted within such recesses and engaging behind the ribs, the key-slabs of each layer having their lower ends projecting downwardly below the blocks and their upper ends terminating short of the tops of the blocks, the lower ends of the key-slabs of the lowermost layer extending into the chase and the lower ends of the key-slabs of each successive upper layer of blocks projecting into the upper ends of the main recesses of the next lower layer of blocks behind the ribs, and a concrete filling within the main recesses of the blocks and extending through the passages between the ribs to be bonded to the key-slabs.

2. A wall construction, comprising a footing provided in its top with a wide chase, horizontal layers of unitary hollow blocks arranged upon the footing, each block including sides and ends forming a main recess, the sides of each block having a pair of vertical opposed spaced ribs formed upon their inner faces for providing reduced passages between the ribs, key-slabs for each layer of blocks and having substantially the width of the main recesses of the blocks and inserted within such recesses and engaging behind the ribs, each key-slab being provided at its bottom with a socket and at its top with a rod projecting above the same, the rod of the key-slab being inserted in the socket of the next upper key-slab, the key-slabs of each layer having their lower ends projecting downwardly below the blocks and their upper ends terminating short of the tops of the blocks, the lower ends of the key-slabs of the lowermost layer extending into the chase and the lower ends of the key-slabs of each successive upper layer of blocks projecting into the upper ends of the main recesses of

the next lower layer of blocks behind the ribs, and a concrete filling within the main recesses of the blocks and extending through the passages between the ribs to be bonded to the key-slabs.

3. A wall construction, comprising horizontal layers of unitary hollow blocks, each block including sides and ends forming a main recess, the sides of each block having a pair of vertical opposed spaced ribs formed upon their inner faces for providing a reduced passage between the ribs, key-slabs for each layer of blocks and having substantially the width of the main recesses of the blocks and inserted within such recesses and engaging behind the ribs, each key-slab being provided near its transverse center with a vertical slot spaced from the top of the key-slab and extending through its bottom for forming spaced legs, each key-slab being provided at the bottom of its legs with sockets and at its top with projecting rods, the rods of the key-slab being inserted into the sockets of the next upper key-slab, the key-slabs of each layer having their lower ends projecting downwardly below the

blocks and their upper ends terminating short of the tops of the blocks, the lower ends of the key-slabs of one layer extending into the recesses of the blocks in the next lower layer, and a concrete filling within the main recesses of the blocks and extending through the passages between the ribs to be bonded to the key-slabs, and horizontal reenforcing rods arranged near the meeting edges of the layers of blocks and passing through the vertical slots.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
742,709	Mitchell et al.	Oct. 27, 1903
1,404,647	Rackle	Jan. 24, 1922
1,499,483	Simms	July 1, 1924
2,212,184	Powell	Aug. 20, 1940
2,239,930	Peebles	Apr. 29, 1941