

July 1, 1941.

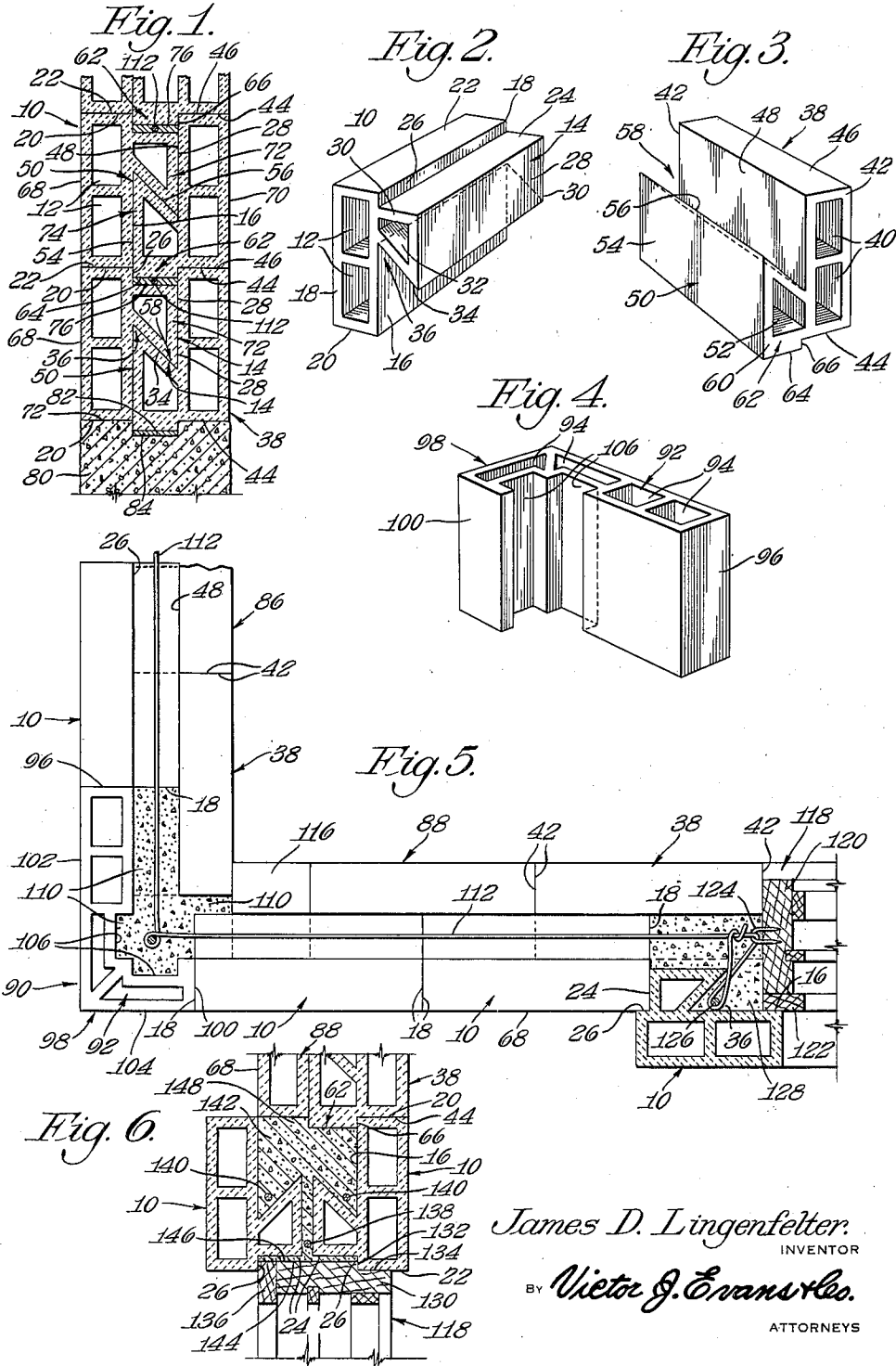
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2,247,614

BUILDING BLOCK

Filed Jan. 2, 1940

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Fig. 7.

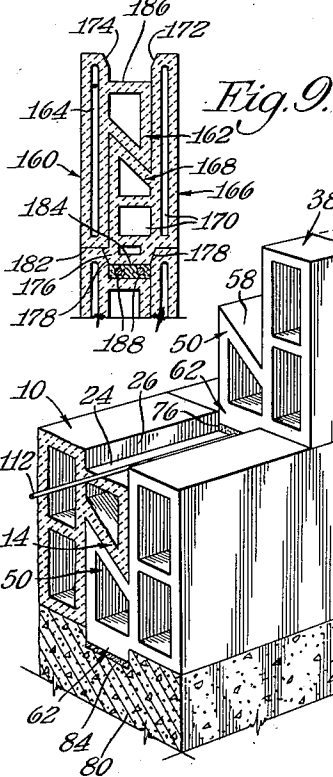
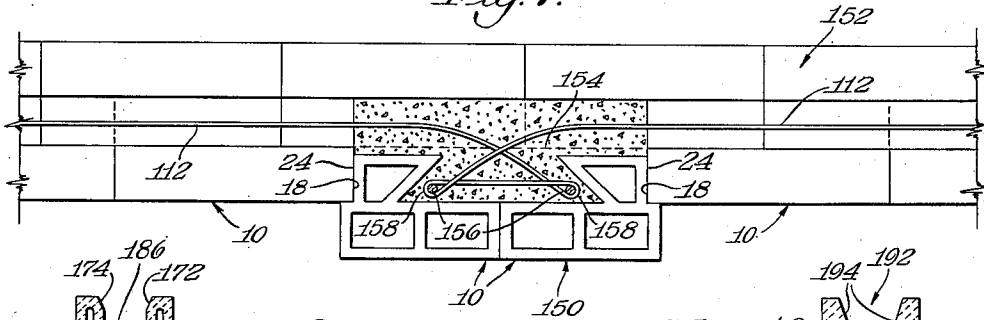


Fig. 8.

Fig. 10.

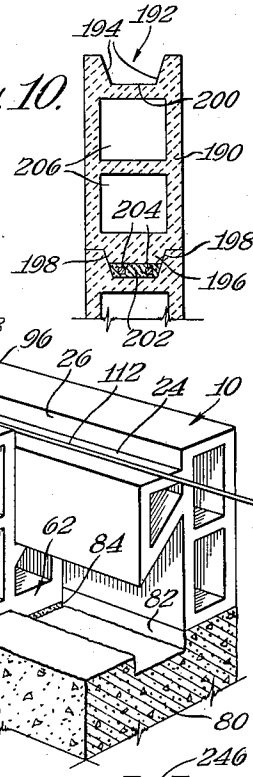
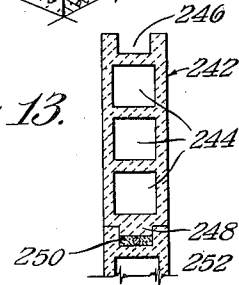
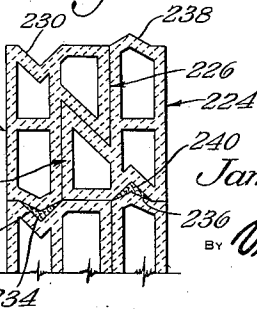
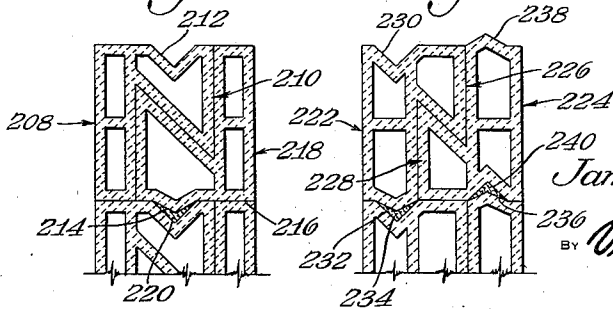


Fig. 11.

Fig. 12.

Fig. 13.



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2,247,614

BUILDING BLOCK

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4 Claims. (Cl. 72-42)

My invention relates to building structures, particularly walls, and includes among its objects and advantages the provision of an improved building block.

An object of my invention is to provide a building block fashioned in such manner as to provide a structurally sound, weather-tight wall without the necessity of using a trowel or mortar bed and head joints, so that an efficient wall may be laid successfully by anyone possessing ordinary mechanical skill in contradistinction to prior types of building blocks which require a skilled mason to properly erect the wall.

Another object is to provide a building block so contoured as to provide a wall of rigid and weatherproof properties solely because of the contour of the block and in which an efficient masonry wall may be erected without the use of trowel, the usual bed and head mortar joints.

Another object is to provide a building block designed to provide cheaply erected wall structures for farm buildings, garages and other small structures, with the building blocks in the wall so interconnected and arranged as to afford ample strength and durability for the purpose intended, with the building blocks interconnected in such manner as to reinforce the wall against lateral displacement, together with novel tying means for effectively interconnecting the blocks in each wall into a unitary structure as well as to effectively interconnect joining walls.

A further object is to provide a building block fashioned to facilitate erection of the wall about window frames and the like, in which certain of the blocks in the wall structure may be so arranged as to form a pier for stiffening a long wall, and in which other blocks in the wall structure may be arranged to provide complete masonry jamb blocks as well as self-supporting, reinforced lintels.

In the accompanying drawings:

Figure 1 is a cross-sectional view of a portion of a wall illustrating the manner in which the building blocks are arranged in interconnected relation in the form of a wall structure;

Figure 2 is a perspective view of one of the building blocks;

Figure 3 is a perspective view of a companion building block;

Figure 4 is a perspective view of a corner building block;

Figure 5 is a top plan view of a portion of two walls and their interconnecting corner as well as a sectional view of one side of a window frame and the adjacent wall structure;

Figure 6 is a cross-sectional view of a head jamb and blocks arranged to provide a reinforced lintel;

Figure 7 is a plan view of a portion of a wall illustrating the manner in which certain of the blocks may be arranged to provide a pier for stiffening a long wall;

Figure 8 is a perspective view of a portion of a building corner;

Figure 9 is a cross-sectional view of a fragment of a silo wall illustrating blocks particularly designed for such walls;

Figure 10 is a cross-sectional view of a portion of a culvert structure illustrating a block particularly designed for such purposes;

Figure 11 is a cross-sectional view of a portion of a wall illustrating a different form of block structure;

Figure 12 is a cross-sectional view of a portion of a wall illustrating another form of block structure; and

Figure 13 is a cross-sectional view of a portion of a partition illustrating a block particularly designed for such wall structures.

In the embodiment selected to illustrate my invention, Fig. 2 illustrates a building block 10 of hollow formation, as illustrated at 12, with an interlocking or key element 14 extending longitudinally of the block and projecting laterally of its otherwise flat face 16. Block 10 has ends 18 arranged in parallelism and at right angles to the longitudinal axis of the block, in addition to a flat bottom face 20 and a top face 22, which top and bottom faces are arranged in parallelism. Fig. 2 illustrates the key element 14 as having a top face 24 paralleling the top face 22 but located at a slightly lower level to provide a wall area 26 extending the full length of the block, which is also true of the key element 14.

Key element 14 includes a flat face 28 paralleling the face 16, and the end faces 30 of the key element lie in planes common to the end faces 18 of the block, and the key element is hollow, as illustrated at 32. I fashion the key element 14 with a face 34 arranged at an angle to the face 16 to provide a re-entering angle 36.

Fig. 3 illustrates a companion block 38, which block I made hollow, as at 40, and the block has parallel end faces 42 arranged at right angles to the longitudinal axis of the block, with the latter of the same length as the block 10. I provide the block 38 with bottom and top faces 44 and 46, respectively.

Projecting laterally of the inner face 48 of the block 38 is a key or anchor element 50 of hollow

formation, as at 52. The general configuration of the key element 50 is identical with the key element 14 in that it includes a face 54 paralleling the face 48 and a face 56 angularly arranged with respect to the face 48 to provide a re-entering angle 58, and the contour and area of the face 56 is identical with the face 34. Face 56 has the same degree of angular relation to the face 48 as the face 34 has to the face 16 of the block illustrated in Fig. 2. The end faces 60 of the key element 50 lie in planes common to the faces 42, and the wall 62 of the key element is of such thickness as to provide a lug 64 projecting below the bottom face 44 and characterized by a narrow face 66 extending the full length of the block 38, but in a plane substantially common to the face 48.

Fig. 1 illustrates the manner in which the blocks 10 and 38 are assembled in the wall. The blocks 10 are arranged in superposed courses exteriorly of the wall structure, while blocks 38 are similarly arranged in superposed courses interiorly of the wall. The outer faces 68 of the blocks 10 lie in a common plane, which is also true of the outer faces 70 of the blocks 38. The wedge-like projection 72 defined by the faces 28 and 34 of the key element 14 extends into the re-entering angle 58 of the block 38, and the face 34 of the key element 14 lies in parallel engagement with the face 56 of the key element 50. Accordingly, the wedge-like projection 74 defined by the faces 54 and 56 of the key element 50 extends into the re-entering angle 36 of the block 10, with the face 28 of the key element 14 lying snugly against the face 48 of the block 38. In the same manner, the face 54 of the key element 50 lies snugly against the face 16 of the block 10.

The bottom faces 20 of the building blocks 10 are adapted to rest on the upper faces 22 of their respective building blocks, while the lower faces 44 of the building blocks 38 are adapted to rest on the top faces 46 of their respective building blocks. With the building blocks so arranged, as illustrated in Fig. 1, the lower margins of the faces 54 of the key elements 50 lie in partly overlapping relation with the faces 26 of the building blocks 10, and the face 66 of each lug 62 lies in overlapping relation with a limited area of the face 48 of the underlying building block 38, but the lugs 62 have their faces 64 spaced slightly from the associated faces 24 on the key elements 14 for the accommodation of a cementing grout 76.

The building blocks 10 in the lowermost course in the wall structure have their faces 20 resting on faces 78 on a concrete foundation 80, which foundation is formed with a shallow trough 82 of sufficient depth to house the lugs 62 and to provide accommodation for a thin body of cementing grout 84. The cementing grout 76 and 84 may be poured from suitable containers or forced into position through the medium of flexible tubes and suitable pressure. In any event, the building blocks 10 and 38 are shaped to nest in a well balanced manner and effectively interconnected by reason of the key elements 14 and 50, as well as the lugs 62. Bonds 76 and 84 supply all necessary or desirable mortar or cemented joints, so that a wall structure erected in accordance with Fig. 1 will produce a structurally sound and weather-tight wall.

Fig. 5 illustrates fragmentary wall runs 86 and 88 and an interconnecting corner 90. The corner 90 is erected from corner blocks 92 such as that illustrated in Fig. 4. The block of Fig. 4 is hollow,

as indicated at 94, and the block includes an end face 96 arranged to lie against the end face 18 of the adjacent building block 10 in its respective course. Face 96 is identical in configuration and area with the face 18 and the vertical length of the block is identical with the vertical length or height of the block 10.

Block 92 is provided with a short right-angular wall 98 having an end face 100 arranged to abut the end face 18 of the adjacent building block 10 in the same course of the wall run 88. The outer faces 102 and 104 of the block 92 lie flush with the faces 68 of the blocks 10 in the wall runs 86 and 88, respectively. Fig. 4 illustrates the block 92 as being provided with vertical channels 106.

Fig. 8 best illustrates the arrangement of the building blocks 10 and 38 and the corner blocks 92. The corner 90 illustrated in this view is provided with a vertical reinforcing rod 108, which rod is continuous throughout the full height of the wall structure and is anchored in the concrete body 110 which fills all the space inside the corner structure, as well as the channels 106. The body 110 is poured one course at a time.

Between each course of building blocks 10 and 38 I provide a horizontal tie rod 112, which tie rod is twisted at 114 about the vertical rod 108, and the rod is located in the bonds 76, as best illustrated in Fig. 1. In actual practice, I prefer to locate the rods 112, supply the bonds 76 by pouring the cementing material into the channels formed by the building blocks 10 and 38, and then place the succeeding blocks in position which brings the lugs 62 into pressure relation with their respective bonds 76. Thus the bonds 76 provide a seal in addition to anchors for the rods 112. Rods 112 restrain the building blocks 10 and 38 from relative movement horizontally, and the rods 108, after the concrete bodies 110 have set, provide effective interconnecting means between the different runs of the rod 112 passing through the different wall runs.

Fig. 5 illustrates the building blocks 10 as being shifted horizontally with respect to the building blocks 38 in that course so that each block 10 will have half its length overlapping half the lengths of two companion blocks 38. Corner block 92 of Fig. 5 is so fashioned as to permit the necessary offset shifting of the blocks 10 and 38 in the wall run 86, and the wall run 88 is provided with a short building block 116 embodying all the structural features of the adjacent building block 38 with the exception of its length. Key elements 14 and 50 have interlocking connection and constitute effective connections between the outer half of the wall made up of the blocks 10 and the inner half made up of the blocks 38. In addition, the key elements 14 and 50 operate to interconnect the blocks in such manner as to restrain the blocks from lateral relative movement so as to effectively reinforce the wall against buckling. Thus the wall will balance effectively and maintain straight alignment for load supporting purposes as well as maintaining the blocks in their original positions.

Fig. 5 illustrates a fragment of a window frame 118 as being incorporated in the wall run 88. The wall is similarly constructed about door and window frames so that the description of one will apply to all. The wood jamb 120 lies in partly overlapping relation with the face 42 of the adjacent building block 38, and a block 10 is arranged on end to bring its face 16 partly in over-

lapping relation with the frame member 122, and the face 26 of the block abuts the outer face 68 of the adjacent block 10 in the wall run 88, with the face 24 of the key element 14 abutting the end face 18 of the adjacent block 10 in the wall run.

Fig. 5 illustrates the rod 112 as being threaded through a staple 124 driven into the jamb 120, and the wire is looped about a vertical rod 126 located within the re-entering angle 36 of the vertically positioned block 10. The space between the grouped blocks and the jamb 120 is filled with concrete 128 so that a weather-tight construction is provided and the block 10 is effectively anchored in the wall structure. Concrete 128 will, of course, extend as a continuous column throughout the full height of the frame 118. Rod 112 as well as that portion of the rod threaded through the staple 124 and looped about the rod 126 will be firmly anchored in the concrete column 128, which column is poured one course at a time in the same manner as the concrete column 110 associated with the corner structure 90.

Fig. 6 illustrates the head jamb of the frame 118 at 130 with a block 10 reversed and incorporated in the inside half of the wall structure to bring its face 26 into overlapping relation with the shoulder 132 on the head jamb, and the face 22 of the block 10 rests on the face 134 of the head jamb. Block 10 so far described in connection with Fig. 6 is turned upside down for association with the frame 118, which brings its face 16 partly into overlapping relation with the face 66 of the lug 62 associated with the adjacent block 38. Face 44 of the block 38 rests directly on the face 20 of the block 10.

A second block 10 is turned upside down to bring its face 26 into overlapping relation with the outer face of the frame member 136, so that the second block 10, with the exception of its key element 14, will lie bodily outside the outer face 68 of the block 10 in the wall run 88. Second block 10 provides a reinforced lintel and its key element 14 faces the key element 14 of the first block 10, with the two key elements spaced for the reception of a reinforcing rod 138. Reinforcing rods 140 are located in the re-entering angles 36 of the key elements 14, and all the space between the grouped blocks is filled with a concrete body 142, which also surrounds the rods 138 and 140. Concrete of the body 142 completely fills the space between the opposing key elements 14, and a concrete bond or seal 144 is provided between the faces 24 of the key elements 14 and the face 146 of the head jamb 130. Thus the two blocks 10 will be effectively anchored in the wall structure and the frame 118 will be effectively secured to the blocks. Concrete body 142 is fashioned to provide a lug 148 which abuts the face 54 of the lug 62, while the lug also abuts the first block 10 so that the interconnected blocks and the body 142 provide a unitary structure which effectively holds the blocks in line.

Fig. 7 illustrates the manner in which relatively long walls may be reinforced by a pier 150, which pier comprises two blocks 10 in each course, with the blocks arranged on end to bring the faces 24 into engagement with the faces 18 of the blocks 10 in the wall 152. The space between the wall blocks 10 adjacent the pier 150 is filled with a concrete column 154, which column is filled course by course and provides a key structure for the key elements 14 so that the vertically arranged blocks 10 in the pier 150 will be firmly in-

terconnected into the wall structure proper. Vertical rods 156 are located within the re-entering angles of the vertical blocks 10, and the horizontal reinforcing or tie rod 112 is looped at 158 about the rods 156 so as to reinforce the concrete column 154 as well as the general pier structure.

Fig. 9 illustrates blocks particularly designed for the construction of silo walls. The two blocks of Fig. 9 are illustrated in cross section but the blocks may be curved in conformity with the curvature of the silo wall to be erected. In Fig. 9, the block 160 includes a key element 162 identical with the key element 14, and the block is made hollow, as at 164. Similarly, block 166 is provided with a key element 168 identical with the key element 50, and the block is made hollow, as at 170, with the block provided with an angular face 172 opposing a similar angular face 174 on the block 160. Both key elements 162 and 168 are made hollow in the same manner as the key elements 14 and 50. The lug 176 of the block 166 is tapered at 178 to engage the tapered faces 172 and 174 of the blocks 160 and 166 below the lug, and the latter is provided with a shoulder 180 which underlies the face 182 of the block 160. The wall of Fig. 9 is provided with a bond 184 between the lug 176 and the face 186 of the block 160, with reinforcing rods 188 embedded in the bond 184.

Fig. 10 illustrates a block construction primarily designed for culvert purposes, wherein the block 190 is provided with a longitudinal trough 192 having angular side walls 194. The block is provided with a lug 196, and the lug is provided with angular side faces 198 arranged to lie in engagement with the side walls 194 of the block thereunder. The lug 196 is spaced from the trough face 200 of the lower block to provide accommodation for a bond 202, including reinforcing rods 204. The block is made hollow, as at 206. In Fig. 11, the block 208 is provided with a key element 210 corresponding to the key element 14, and the block is provided with a V-groove 212 for the reception of a V-rib 214 located on the bottom face 216 of the block 218. V-groove 212 is deeper than the received rib 214 so as to provide space for a bond 220. In other respects, the blocks 208 and 218 are respectively similar to the blocks 10 and 38.

Fig. 12 illustrates blocks 222 and 224 wherein the blocks are provided with key elements 226 and 228, respectively, with the block 222 provided with a V-groove 230 and a V-shaped rib 232 aligned vertically underneath the V-groove, so that the rib 232 of one block will lie inside the groove 230 of the block thereunder, with the unfilled space provided with a bond 234.

Block 224 is provided with a V-notch 236 located vertically underneath a V-rib 238 on the upper face of the block, so that the rib 238 of one block will lie in the V-groove 236 of the next higher block, with the space between the walls of the groove and the rib provided with a bond 240. In other respects, blocks 222 and 224 are similar to the blocks 10 and 38.

Fig. 13 illustrates a block primarily designed for partition purposes, wherein the block 242 is made hollow, as at 244, and the upper side of the block is provided with a channel 246. The lower side of the block is provided with a lug 248, and the lug is adapted to be positioned in the groove 246 in the next lower block 242, with the space between the walls of the groove and

the lug provided with a bond 250 in which I embed a reinforcing rod 252.

In all the forms disclosed, the blocks in the wall structure are effectively interlocked or keyed against lateral bending so that the wall is so constructed as to remain perfectly straight. Corner blocks 92 may, of course, be reversed end for end and need not all be positioned in the same general direction. The blocks may be assembled into a wall structure in simple and easy steps, and construction of the wall does not require the services of a skilled mason. All the blocks are so fashioned as to permit offsetting of the blocks in one course with respect to the adjacent course or courses, with the interkeying means so devised as to cooperate with the offset arrangement of the blocks to eliminate all continuous joints through the building wall.

Having thus described certain embodiments of my invention in detail, it is, of course, understood that I do not desire to limit the scope thereof to the exact details set forth except insofar as those details may be defined in the appended claims.

I claim:

1. In a masonry wall, blocks adapted to be arranged in contacting superposed courses in the wall, the blocks in each course having top and bottom key formations respectively interlocking with the corresponding bottom and top key formations of the next higher and lower courses, said key formations being in the nature of a channel extending longitudinally of the wall along the tops of the blocks in each course and lugs extending longitudinally of the wall at the bottoms of the blocks in each course for reception within the channels of the next lower courses, said channels being deeper than the lugs disposed therein to receive a bonding material and reinforcing rods.

2. In a masonry wall, blocks adapted to be arranged in contacting superposed courses in the wall, each course comprising a series of first blocks arranged end to end and a series of second blocks arranged end to end, said first blocks in each course having hook-like keys, hook-like keys on said second blocks in each course adapted for hooked connection with the hook-like keys on said first blocks in that course, the joints between the abutting ends of said first blocks being offset with respect to the joints between the abutting ends of the second blocks, all said hook-like keys extending longitudinally of their respective first and second blocks and being coextensive in length therewith, to bring each key of the first blocks in each course into overlapping relation with two keys on the second blocks in that course, the hook-like keys on said first blocks being located beneath the upper edges of their respective first blocks and abut-

ting the second blocks in their respective courses to provide channels, and said second blocks in each course being provided with lugs arranged to be disposed in the channels in the next lower course.

3. In a masonry wall, blocks adapted to be arranged in contacting superposed courses in the wall, each course comprising a series of first blocks arranged end to end and a series of second blocks arranged end to end, said first blocks in each course having hook-like keys, hook-like keys on said second blocks in each course adapted for hooked connection with the hook-like keys on said first blocks in that course, the joints between the abutting ends of said first blocks being offset with respect to the joints between the abutting ends of the second blocks, all said hook-like keys extending longitudinally of their respective first and second blocks and being coextensive in length therewith, to bring each key of the first blocks in each course into overlapping relation with two keys on the second blocks in that course, the hook-like keys on said first blocks being located beneath the upper edges of their respective first blocks and abutting the second blocks in their respective courses to provide channels, and said second blocks in each course being provided with lugs arranged to be disposed in the channels in the next lower course, said channels being deeper than said lugs to provide space for a bond material.

4. In a masonry wall, blocks adapted to be arranged in contacting superposed courses in the wall, each course comprising a series of first blocks arranged end to end and a series of second blocks arranged end to end, said first blocks in each course having hook-like keys, hook-like keys on said second blocks in each course adapted for hooked connection with the hook-like keys on said first blocks in that course, the joints between the abutting ends of said first blocks being offset with respect to the joints between the abutting ends of the second blocks, all said hook-like keys extending longitudinally of their respective first and second blocks and being coextensive in length therewith, to bring each key of the first blocks in each course into overlapping relation with two keys on the second blocks in that course, the hook-like keys on said first blocks being located beneath the upper edges of their respective first blocks and abutting the second blocks in their respective courses to provide channels, and said second blocks in each course being provided with lugs arranged to be disposed in the channels in the next lower course, said channels being deeper than said lugs to provide space for a bond material and reinforcing rods.

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