

April 14, 1953

H. F. ZAGRAY
INTERLOCKED BUILDING BLOCKS

2,634,602

Filed Feb. 25, 1948

3 Sheets-Sheet 1

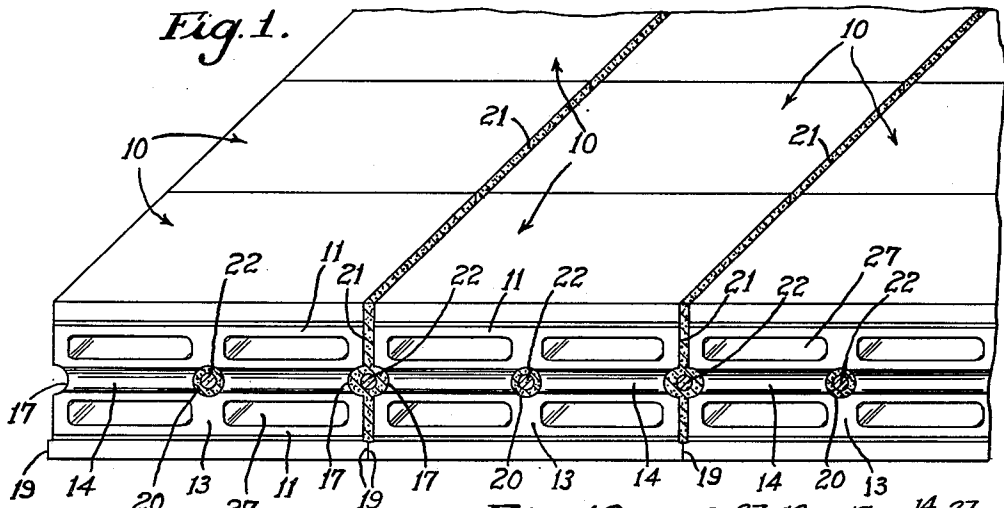
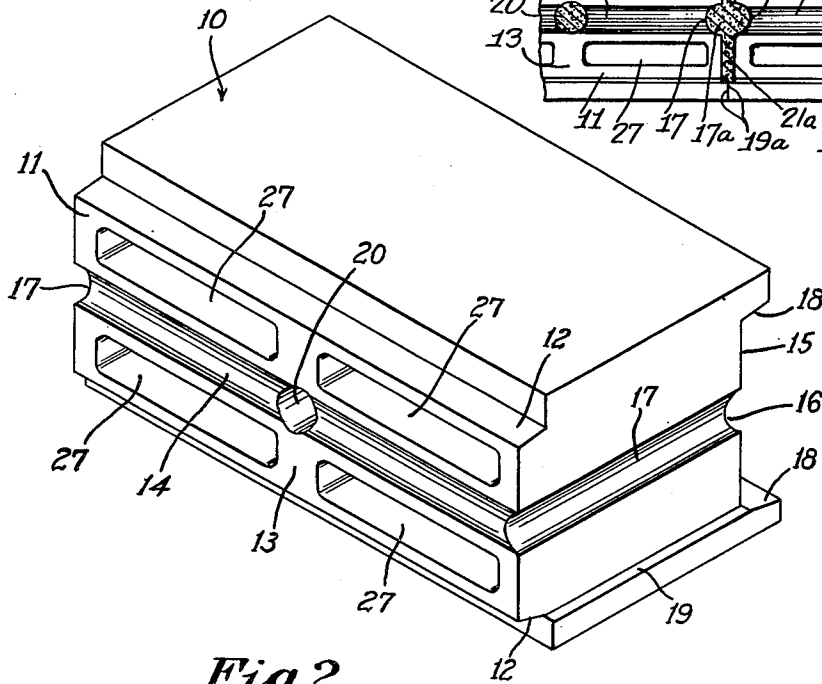
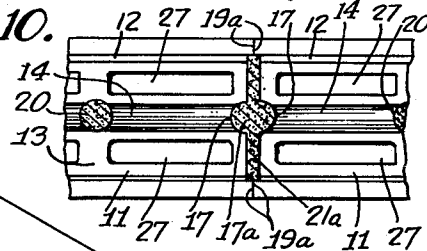


Fig. 10.



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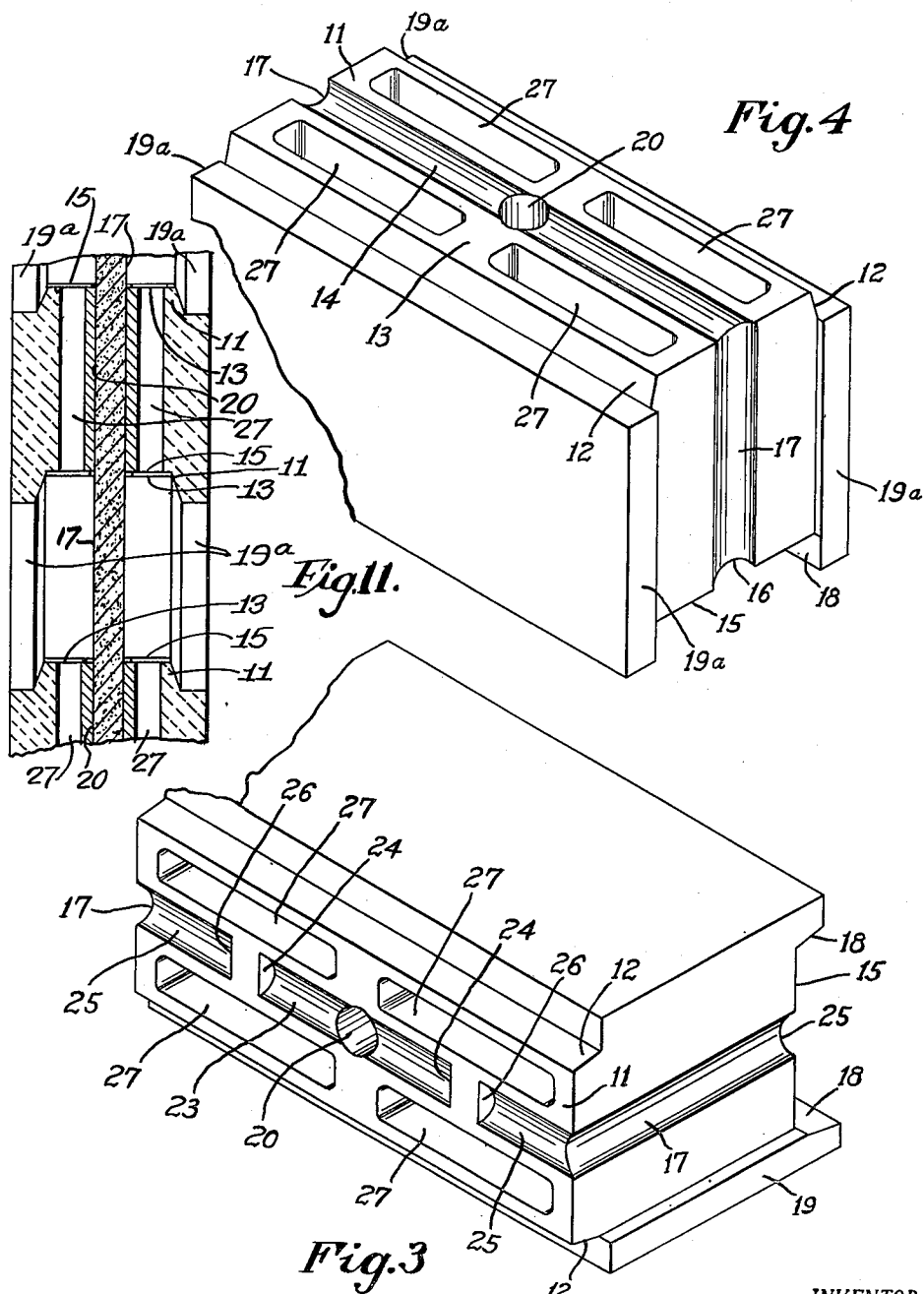
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3 Sheets-Sheet 3

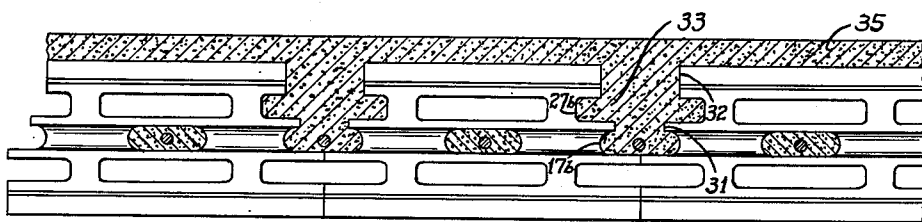


Fig. 8

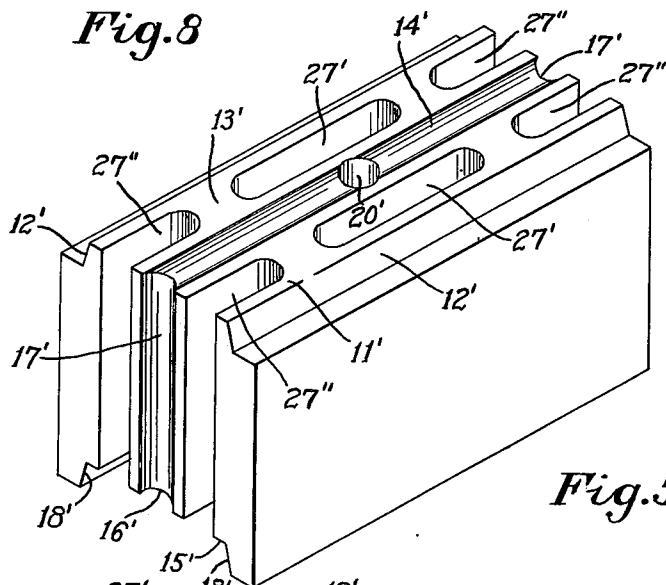


Fig. 5

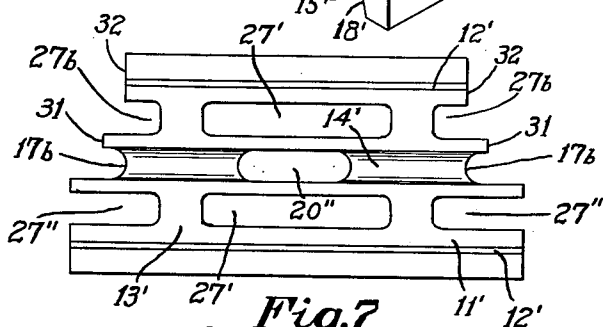


Fig. 7

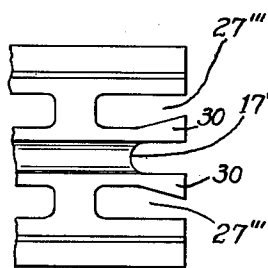


Fig. 6

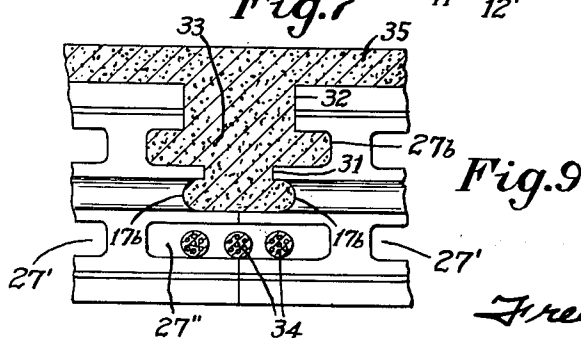


Fig. 9

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INTERLOCKED BUILDING BLOCKS

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9 Claims. (Cl. 72—38)

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The invention relates to building blocks, preferably formed of concrete or the like, for the construction of floors, walls and similar masonry structures.

An object of the invention is to provide a building block of this character which is especially adapted for the construction of reinforced concrete floors and the like.

Another object is to provide such a building block having transverse apertures therethrough and longitudinal and transverse grooves adapted to register with similar grooves of similar blocks when built into a floor, or the like, so as to provide intercommunicating passages into which concrete, or other semi-liquid bonding material, may be poured, or forced under pressure, to bond the blocks together in a solid floor or wall.

A further object is to provide such blocks with interlocking ribs and recesses for interlocking with similar blocks in the construction of a floor, wall or the like.

A still further object is to provide a block of this character having air passages adapted to register with similar passages in adjacent, interlocking blocks, so as to provide air spaces within the floor or other structure.

Another object of the invention is to provide floor blocks of the character referred to having transversely disposed ribs upon opposite ends of their lower sides, so as to space the remainder of the end surfaces of the block from the end surfaces of similar blocks, when laid up in a floor or similar structure, providing mortar grooves into which concrete, or other semi-plastic or liquid bonding material, may be poured, or forced under pressure, so as to fill said spaces and also the communicating passages formed by the grooves upon adjacent blocks in order to bond the entire floor or similar structure together in a solid unit.

A further object is to provide such a floor structure in which reinforcing metal rods are located through said openings and grooves of the blocks and embedded within the concrete or other bonding material.

A still further object of the invention is to provide a block in which elongated air space openings are provided through the block on opposite sides of the median line thereof and intermediate the ends thereof, and air space forming grooves are located in the ends of the block, each groove being one-half the width of said air space openings.

Another object is to provide such a block, especially adapted for building floors, in which

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the ends of the block are cut away above the median line whereby concrete or the like poured from above may enter the spaces between adjacent blocks and fill the grooves in the cut away portions to anchor the blocks together in the floor.

The above objects, together with others which will be apparent from the drawings and following description, or which may be later referred to, may be attained by constructing the improved floor and wall block in the manner hereinafter described in detail and illustrated in the accompanying drawings, in which:

Figure 1 is a sectional, perspective view of a portion of a floor constructed of building blocks embodying the invention;

Fig. 2 an enlarged, perspective view of one of the improved floor blocks;

Fig. 3 is a similar view of a slightly modified form of floor block;

Fig. 4 a perspective view of a block embodying the invention especially adapted for the building of walls or similar vertical structures;

Fig. 5 a perspective view of a modified form of wall block;

Fig. 6 a fragmentary top plan view of one end portion of a slight modification of the end construction of a block similar to that shown in Fig. 5;

Fig. 7 a modification of the block shown in Fig. 5, adapting it for use as a floor block;

Fig. 8 a sectional view through a portion of a floor constructed with blocks such as shown in Fig. 7;

Fig. 9 an enlarged, fragmentary, sectional view of a portion of a floor, showing the abutting end portions of two of the blocks as shown in Figs. 7 and 8;

Fig. 10 a fragmentary top plan sectional view of portions of two of the wall blocks shown in Fig. 4, showing the manner in which a wide vertical mortar joint with enlarged central portion is formed between the opposed ends of blocks in each course; and

Fig. 11 a fragmentary, vertical transverse section through a portion of a wall, showing a plurality of blocks having the ribs in interlocking relationship and illustrating the horizontal joints between the blocks.

Referring first to the form of block shown in Figs. 1 and 2 and especially adapted for use in the building of floors or similar horizontal masonry structures, the block is indicated generally at 10 and is preferably formed of concrete or the like.

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A horizontal, longitudinally disposed rib or projection 11 is formed upon one side of each block preferably having slightly tapered top and bottom walls, as indicated at 12, and the substantially flat inside wall 13 provided with a central, longitudinally disposed, horizontal groove 14.

A longitudinal recess 15, of sufficient width to receive the rib or projection 11, and of slightly greater depth than the height of said rib, extends horizontally along the opposite side of the block to the rib or projection 11, and has a centrally located, horizontal, longitudinal groove 16 therein, corresponding to the groove 14 in the rib or projection 11.

Each end of the block has a similar, transversely disposed, horizontal groove 17 therein, being preferably half-round and of the same width and shape as the groove 14 and 16 and communicating at opposite ends with the ends of the longitudinal grooves 14 and 16.

The upper and lower sides of the recess 15 are preferably slightly tapered as shown at 18, to conform to the tapered top and bottom walls 12 of the rib or projection 11 so as to receive the rib or projection of an adjacent block.

A transversely disposed, horizontal rib 19 is formed upon each end of the block at the lower side thereof, and a central, transversely disposed, horizontal opening 20 is formed through the block from one side thereof to the other, communicating with the central portions of the longitudinal grooves 14 and 16.

In building a floor or similar horizontal masonry structure of the improved blocks, the blocks are laid up in the manner shown in Fig. 1, the blocks in each course abutting adjacent blocks at their ends only at the transverse ribs 19 at the lower sides thereof, so as to space the ends of adjacent blocks apart forming mortar spaces 21 therebetween as indicated in Fig. 1.

The blocks in succeeding courses register with each other, as shown in Fig. 1, rather than being staggered as is customary in building a masonry wall, so that the mortar spaces 21 extend entirely through the floor structure.

Metal reinforcing rods 22 may be located through the transverse apertures 20 in succeeding courses of the blocks and also through the enlargements in the mortar spaces 21, formed by the adjacent grooves 17 in the ends of the blocks. When the floor is laid up in this manner concrete or other semi-liquid bonding material may be poured or forced under pressure into the mortar spaces 21 and will pass into the longitudinal and horizontal transverse passages formed by the adjacent longitudinal grooves 14 and 16 and by the transverse openings 20 all of which are in communication with each other, thus forming a concrete network which binds all of the blocks together in a solid unit.

Preferably, sufficient concrete or the like is used to provide a layer thereof about two inches thick upon the top of the masonry structure thus formed, so as to provide a finished concrete floor.

In Fig. 3 is shown a slight modification of the block shown in Figs. 1 and 2, in which all of the parts thereof may be the same as shown and described in reference to Fig. 2, and the same reference numerals are applied thereto, excepting that instead of having continuous longitudinal grooves 14 and 16 on opposite sides of the block, a central groove 23 communicates with the central transverse opening 20 and

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terminates in closed ends 24 spaced from each end of the block.

A short end groove 25, having a closed end 26 spaced from the adjacent end of the central groove 23, extends into each end of the block, communicating with the transverse end grooves 17. These blocks are laid up in the same manner as the blocks shown in Figs. 1 and 2 in order to form a floor or similar structure.

In both cases the blocks may preferably be provided with transverse air spaces 27 located above and below the central longitudinal grooves and adapted to register with similar air spaces in adjacent blocks, when laid up in a floor as shown in Fig. 1, so as to form air spaces entirely through the floor.

In Fig. 4 is shown a block especially adapted for use in the erection of walls or similar vertical masonry structures, and this block differs from the block shown in Fig. 2 only in that it is adapted to be located in vertical rather than horizontal position as shown in Fig. 2, when built into a wall, and is provided on opposite sides at each end with the ribs 19a, similar to the ribs 19 above described so that mortar spaces formed by the ends of adjacent blocks are closed at both sides. Otherwise this block is as shown in Fig. 2, and the same reference numerals are applied thereto.

The concrete or other semi-liquid bonding material is poured into the vertical wall constructed of these blocks, or forced under pressure therein, in the same manner as above described, and the wall may or may not be reinforced with steel rods as desired.

As shown in Fig. 10, when the wall blocks, as disclosed in Fig. 4 are laid up in a wall and grout or mortar poured into the mortar spaces, a wide flat, vertical mortar joint 21a is formed between the opposed ends of blocks in each course with central enlargement 17a.

This is a very important feature of this wall block as it provides an absolutely water-tight vertical mortar joint, and, as is well known in the masonry art, the vertical mortar joint between blocks or bricks in each course in a wall is the weakest point of the entire wall.

Furthermore, as shown in Fig. 11, the space between the flat top 13 of the rib 11 and the flat top wall 15 of the recess in the next upper block is so slight that grout will not flow outwardly therethrough from the central mortar space 17 or 20, or any appreciable extent, so that there is no danger of grout entering the cored air spaces 27.

In Fig. 5 is shown the modification of the wall block in which a longitudinal rib or projection 11' is formed upon the top of the block, having the slightly tapered side walls 12' and the substantially flat top wall 13' provided with a central longitudinally disposed horizontal groove 14'.

The longitudinal recess 15', of the same width as the rib 11', is formed in the bottom side of the block and has a centrally located longitudinal groove 16' therein, similar to the groove 14' in the top of the block.

Vertically disposed grooves 17', of sufficient width and contour to receive the grooves 14' and 16', are located in the opposite end walls of the block and communicate at their upper and lower ends with the ends of the grooves 14' and 16' respectively.

The side walls 18' of the recess 15' are preferably tapered, conforming to the tapered side

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walls 12' of the rib 11', so as to receive the rib or projection of the next lower block when laid up in a wall.

A central, vertically disposed opening 20' is formed through the block, from top to bottom thereof, communicating at opposite ends with the central portion of the horizontal grooves 14' and 16'.

Vertically disposed air spaces 27' extend entirely through the block from top to bottom on opposite sides of the longitudinal center thereof and at points intermediate the ends of the block, and vertical grooves 27'' are formed at each end of the block, these grooves being one-half the length of the air spaces 27' so that when similar blocks are butted together endwise in a wall, the opposed grooves 27'' will form air spaces of the same size as the air spaces 27' and adapted to register with similar air spaces in blocks located above and below when laid up in a wall. These blocks, the same as block shown in Fig. 4, are adapted to be bonded together in a wall by mortar or the like filling the grooves 14', 16', 17' and openings 20'.

In Fig. 6 is shown a slight modification of the end portion of a wall block similar to that shown in Fig. 5, the only difference being that the vertical grooves in the ends of the block are of considerably greater depth as indicated at 17'' in Fig. 6, and the outer ends of the air space grooves at the ends of the blocks are reduced in thickness toward the outer end of the block as indicated at 27''', thus increasing the thickness of the walls 30 between the grooves 17'' and 27''' so as to more effectively prevent mortar from the central mortar grooves 17'' from entering the air spaces 27''' when the blocks are laid up in a wall.

The block shown in Fig. 7 is modified so as to be especially designed for the building of a floor and may be generally of the same construction as the block shown in Fig. 5, excepting that the central mortar opening 28'' is of considerable width as compared with its thickness and the vertical mortar grooves 17b at each end of the block are of increased depth.

Furthermore the end portions of the block are cut away above the end grooves 17b, as indicated at 31, and the ends of the block above the end air space grooves 27b are further cut away as indicated at 32. Otherwise the block shown in Fig. 7 is of the same construction as the block shown in Fig. 5 and similar reference numerals are applied thereto.

When the blocks such as shown in Fig. 7 are laid up in a floor as shown in Fig. 8, the opposed ends of adjacent blocks being cut away at 31 and 32 as above described will form enlarged concrete or mortar receiving openings into which mortar or concrete poured upon the top of the block to form the surface of the floor will enter, filling the grooves 17b and 27b providing an anchor to hold the blocks solidly together as indicated at 33.

This is shown more clearly on a larger scale in Fig. 9 in which it is seen that the ends of opposed blocks are firmly bonded together by the concrete or other bonding material filling the spaces between the blocks from and including the central groove 17b to the top of the blocks while the air spaces 27' and 27'' at the bottom of the blocks are entirely unobstructed throughout the floor whereby cables, electric wires, conduits and the like, as indicated at 34, may be located through any of these air spaces.

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In building a floor with the blocks as shown in Figs. 1 and 8, the preferred method is to first stack the blocks in vertical columns, place rods through the openings 20 or 20'' of all blocks in a column, and then pour concrete or the like through these openings so as to bond the blocks together in an integral column.

After the concrete has set a plurality of these rigid columns are laid side by side, as shown in Figs. 1 and 8 and concrete or the like is poured into the openings between adjacent columns, bonding the blocks together in a solid, rigid floor, the concrete being poured to any desired depth upon the tops of the blocks, as indicated at 35 in Fig. 8, if desired.

I claim:

1. A substantially rectangularly shaped masonry building block, said block including a pair of opposite sides, a pair of opposite longitudinal faces and a pair of opposite transverse faces, a longitudinal rib formed on one of said longitudinal faces and a recess formed on the other of said longitudinal faces, said recess being of slightly greater depth than the height of the rib and otherwise corresponding in width and shape to said rib, there being a longitudinal centrally located groove in the rib and a correspondingly shaped central groove in the recess, half round centrally disposed grooves formed in said opposite transverse faces of the block, said half round grooves communicating at their ends with said longitudinal grooves, a central opening extending through the block in substantially parallel relation with said opposite sides and opposite transverse faces of the block and communicating at its opposite ends with the central portions of said longitudinal grooves, abutments in said longitudinal grooves located substantially midway between said central opening and the opposite transverse faces of the block, and ventilating openings disposed on opposite sides of said longitudinal grooves and extending through the block in substantially parallel relation with said central opening and said opposite sides, the opposite ends of said ventilating openings being located in said rib and said recess respectively.

2. A substantially rectangularly shaped masonry building block, said block including a pair of opposite sides, a pair of opposite longitudinal faces and a pair of opposite transverse faces, a longitudinal rib formed on one of said longitudinal faces and a recess formed on the other of said longitudinal faces, said recess corresponding in width and shape to said rib, there being a longitudinal centrally located groove in the rib and a correspondingly shaped central groove in the recess, half round centrally disposed grooves formed in said opposite transverse faces of the block, said half round grooves communicating at their ends with said longitudinal grooves, a central opening extending through the block in substantially parallel relation with said opposite sides and opposite transverse faces of the block and communicating at its opposite ends with the central portions of said longitudinal grooves, abutments in said longitudinal grooves located substantially midway between said central opening and the opposite transverse faces of the block, ventilating openings disposed on opposite sides of said longitudinal grooves and extending through the block in substantially parallel relation with said central opening and said opposite sides, the opposite ends of said ventilating openings being located in said rib and said recess respectively, and a flange on each transverse face of the block, said flange extending substantially from one of

said longitudinal faces to the other, each flange having a surface thereof coplanar with a side of the block.

3. A substantially rectangularly shaped masonry building block, said block including a pair of opposite sides, a pair of opposite longitudinal faces and a pair of opposite transverse faces, a relatively wide longitudinal rib formed on one of said longitudinal faces, said rib having a substantially flat top surface and outwardly inclined side surfaces, and a recess formed on the other of said longitudinal faces, said recess corresponding in width and shape to said rib, there being a longitudinal centrally located groove in the rib and a correspondingly shaped central groove in the recess, a central opening extending through the block in substantially parallel relation with said opposite sides and opposite transverse faces of the block and communicating at its opposite ends with the central portions of said longitudinal grooves, said longitudinal grooves extending from said central opening to points substantially midway between the central opening and each transverse face of the block and having closed ends at said points and longitudinal centrally disposed grooves in the rib and recess beyond said closed ends and aligned with said first named longitudinal centrally located grooves and extending to the opposite transverse faces of the block, and centrally disposed grooves formed in said opposite transverse faces of the block, said last named grooves communicating at their ends with said longitudinal grooves.

4. A substantially rectangularly shaped masonry building block, said block including a pair of opposite sides, a pair of opposite longitudinal faces and a pair of opposite transverse faces, a longitudinal rib formed on one of said longitudinal faces and a recess formed on the other of said longitudinal faces, said recess corresponding in width and shape to said rib, there being a longitudinal centrally located groove in the rib and a correspondingly shaped central groove in the recess, a central opening extending through the block in substantially parallel relation with said opposite sides and opposite transverse faces of the block and communicating at its opposite ends with the central portions of said longitudinal grooves, abutments in said longitudinal grooves located substantially midway between said central opening and the opposite transverse faces of the block, ventilating openings disposed on opposite sides of said longitudinal grooves and extending through the block in substantially parallel relation with said central opening and said opposite sides, the opposite ends of said ventilating openings being located in said rib and said recess respectively and centrally disposed grooves formed in said opposite transverse faces of the block, said centrally disposed grooves communicating at their ends with the longitudinal grooves.

5. A substantially rectangularly shaped masonry building block, said block including a pair of opposite sides, a pair of opposite longitudinal faces and a pair of opposite transverse faces, a longitudinal rib formed on one of said longitudinal faces and a recess formed on the other of said longitudinal faces, said recess being of slightly greater depth than the height of the rib and otherwise corresponding in width and shape to said rib, there being a longitudinal centrally located groove in the rib and a correspondingly shaped central groove in the recess, a central opening extending through the block in substantially parallel relation with said opposite sides

and opposite transverse faces of the block and communicating at its opposite ends with the central portions of said longitudinal grooves, abutments in said longitudinal grooves located substantially midway between said central opening and the opposite transverse faces of the block, ventilating openings disposed on opposite sides of said longitudinal grooves and extending through the block in substantially parallel relation with said central opening and said opposite sides, and a flange on each transverse face of the block, said flange extending substantially from one of said longitudinal faces to the other, each flange having a surface thereof coplanar with a side of the block.

6. A substantially rectangularly shaped masonry building block, said block including a pair of opposite sides, a pair of opposite longitudinal faces and a pair of opposite transverse faces, a longitudinal rib formed on one of said longitudinal faces, said rib having a substantially flat top surface and outwardly inclined side surfaces and a recess formed on the other of said longitudinal faces, said recess corresponding in width and shape to said rib, there being a longitudinal centrally located groove in the rib and a correspondingly shaped central groove in the recess, a central opening extending through the block in substantially parallel relation with said opposite sides and opposite transverse faces of the block and communicating at its opposite ends with the central portions of said longitudinal grooves, said longitudinal grooves extending from said central opening to points substantially midway between the central opening and the opposite transverse faces of the block, abutments at said points, and longitudinal centrally located grooves in the rib and recess beyond said abutments and aligned with said first named longitudinal centrally located grooves and extending to opposite transverse faces of the block, centrally disposed grooves formed in said opposite transverse faces of the block, said centrally disposed grooves communicating at their ends with said longitudinal grooves, and a flange on each transverse face of the block, said flanges extending substantially from one of said longitudinal faces to the other, each flange having a surface thereof coplanar with a side of the block.

7. A substantially rectangularly shaped masonry building block, said block including a pair of opposite sides, a pair of opposite longitudinal faces and a pair of opposite transverse faces, a longitudinal relatively wide rib formed on one of said longitudinal faces and a recess formed on the other of said longitudinal faces, said recess corresponding in width and shape to said rib, there being a longitudinal centrally located groove in the rib and a correspondingly shaped central groove in the recess, a central opening extending through the block in substantially parallel relation with said opposite sides and opposite transverse faces of the block, and communicating at its opposite ends with the central portions of said longitudinal grooves, abutments in said longitudinal grooves located substantially midway between said central openings and the opposite transverse faces of the block, ventilating openings disposed on opposite sides of said longitudinal grooves and extending through the block in substantially parallel relation with said central opening and said opposite sides, the opposite ends of said ventilating opening being located in said rib and said recess respectively, and a flange on each transverse face of the block, said

flange extending substantially from one of said longitudinal faces to the other, each flange having a surface thereof coplanar with a side of the block.

8. A substantially rectangularly shaped masonry building block, said block including a pair of opposite sides, a pair of opposite longitudinal faces and a pair of opposite transverse faces, a longitudinal rib formed on one of said longitudinal faces, said rib being of a width only slightly less than the width of the block and having a substantially flat top surface and downwardly and outwardly inclined side surfaces, and a recess formed on the other of said longitudinal faces, said recess being of slightly greater depth than the height of the rib and otherwise corresponding in width and shape to said rib, there being a longitudinal centrally located groove in the rib and a correspondingly shaped central groove in the recess, so as to form a wide, thin, flat longitudinal space of slightly less width than the block with an enlarged portion formed partly in each longitudinal face, a centrally disposed groove formed in each opposite transverse face of the block, said centrally disposed grooves communicating at their ends with said longitudinal grooves, a central opening extending through the block in substantially parallel relation with said opposite sides and opposite transverse faces of the block and communicating at its opposite ends with the central portions of said longitudinal grooves, ventilating openings disposed on opposite sides of said longitudinal grooves and extending through the block in substantially parallel relation with said central opening and said opposite sides, the opposite ends of said ventilating openings being located in said rib and said recess respectively, and flanges on each transverse face of the block, said flanges extending substantially from one of said longitudinal faces to the other, each flange having a surface thereof coplanar with a side of the block so as to form a wide, substantially thick, flat, transverse mortar space of slightly less width than the block with a central enlarged portion formed partly in each transverse face of the block.

9. Wall construction comprising superposed similar rectangularly shaped masonry building blocks, each block including a pair of opposite sides, a pair of opposite longitudinal faces and a pair of opposite transverse faces, a longitudinal rib formed on one of said longitudinal faces, said rib being of a width only slightly less than the width of the block and having a substantially flat top surface and downwardly and outwardly inclined side surfaces, and a recess formed on the other of said longitudinal faces, said recess being of slightly greater depth than the height of the

rib and otherwise corresponding in width and shape to said rib, there being a longitudinal centrally located groove in the rib and a correspondingly shaped central groove in the recess, so as to form a wide, thin, flat longitudinal space of slightly less width than the width of the superposed blocks, said space having an enlarged portion formed partly in each longitudinal face, a centrally disposed groove formed in each opposite transverse face of the block, said centrally disposed grooves communicating at their ends with said longitudinal grooves, a central opening extending through the block in substantially parallel relation with said opposite sides and opposite transverse faces of the block and communicating at its opposite ends with the central portions of said longitudinal grooves, ventilating openings disposed on opposite sides of said longitudinal grooves and extending through the block in substantially parallel relation with said central opening and said opposite sides, the opposite ends of said ventilating openings being located in said rib and said recess respectively, and flanges on each transverse face of the block, said flanges extending substantially from one of said longitudinal faces to the other, each flange having a surface thereof coplanar with a side of the block so as to form a wide, substantially thick, flat, transverse mortar space of slightly less width than the block with a central enlarged portion formed partly in each opposed transverse face of abutting blocks, and mortar filling said longitudinal grooves, centrally disposed grooves, central openings and transverse mortar spaces, all of said mortar being entirely within the outline of the wall to provide a dry wall with tight joints.

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References Cited in the file of this patent
UNITED STATES PATENTS

Number	Name	Date
738,643	Van Camp	Sept. 8, 1903
960,217	Dodds	May 31, 1910
1,154,546	Peters	Sept. 21, 1915
1,378,735	Talbot	May 17, 1921
1,623,094	Cooley et al.	Apr. 5, 1927
2,075,560	Warren	Mar. 30, 1937

FOREIGN PATENTS

Number	Country	Date
8,387	Great Britain	1903
415,757	France	1910
21,481	France	1920
611,679	France	1926
813,211	France	1937
546,392	Great Britain	1942