

July 31, 1934.

A. HENDERSON

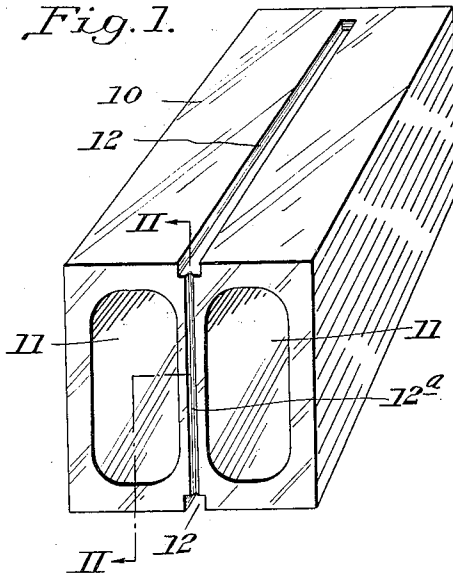
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BUILDING UNIT

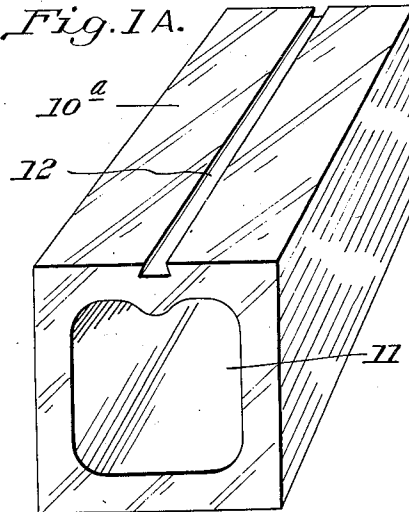
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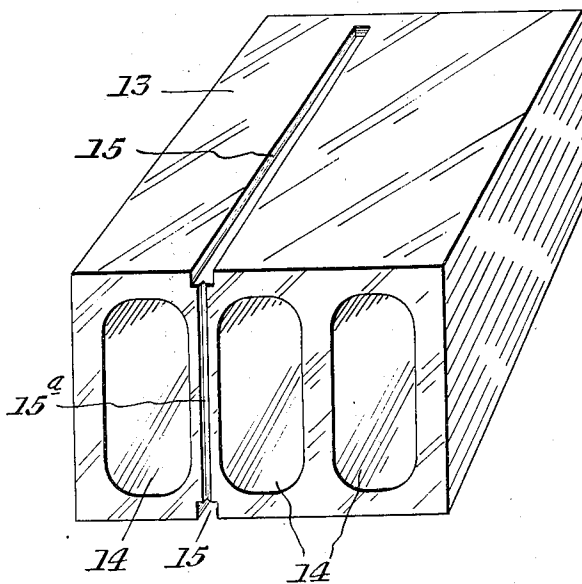
*Fig. 1.*



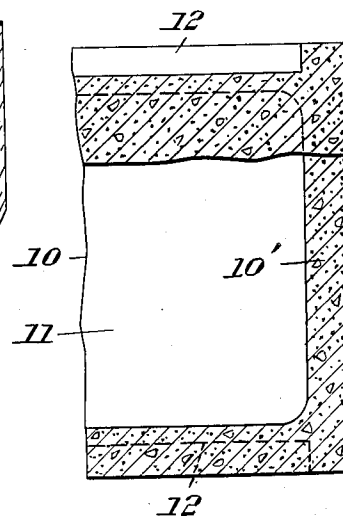
*Fig. 1 A.*



*Fig. 2.*



*Fig. 2 A.*



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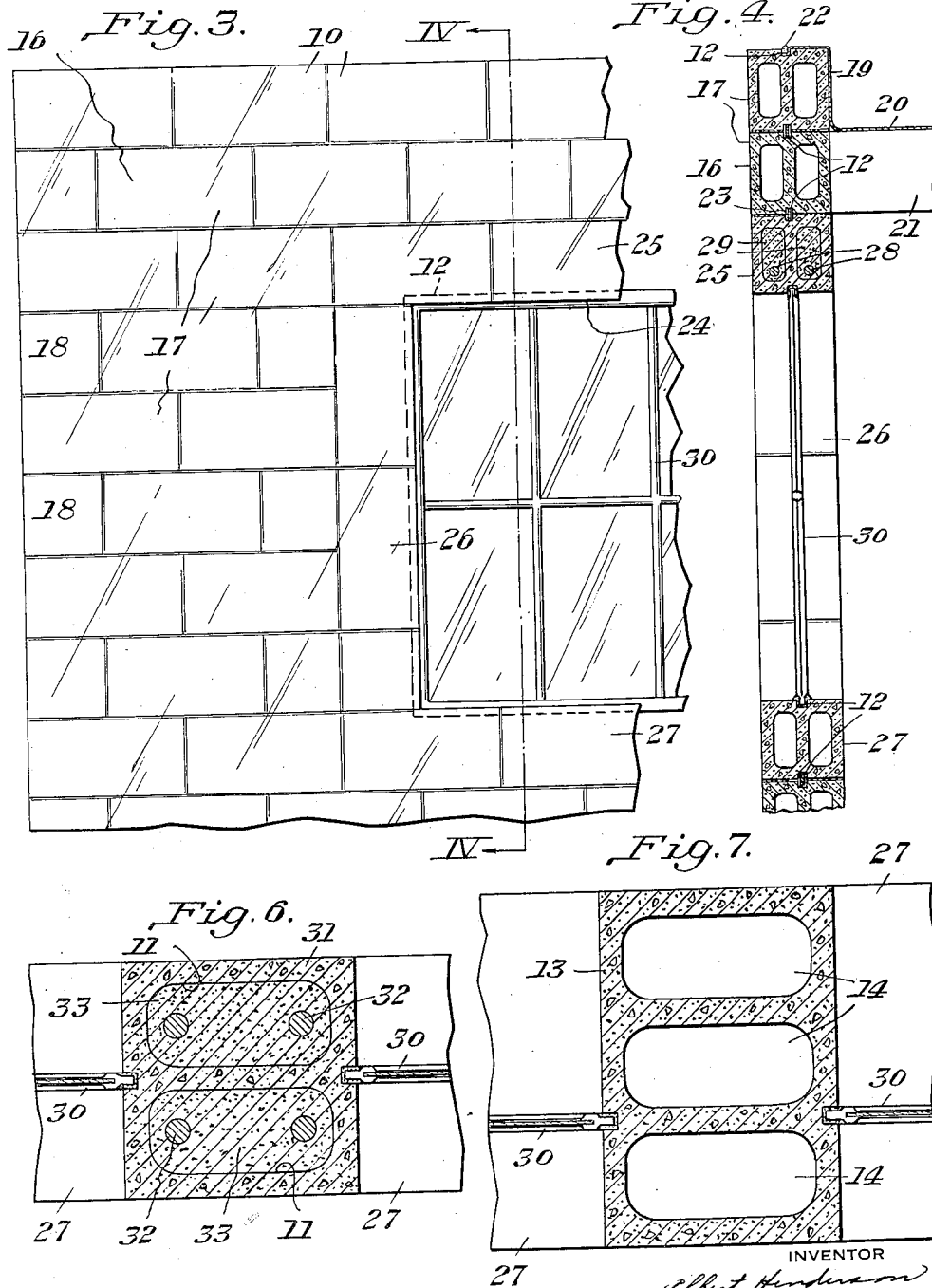


Fig. 7.

Fig. 6.

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Fig. 5.

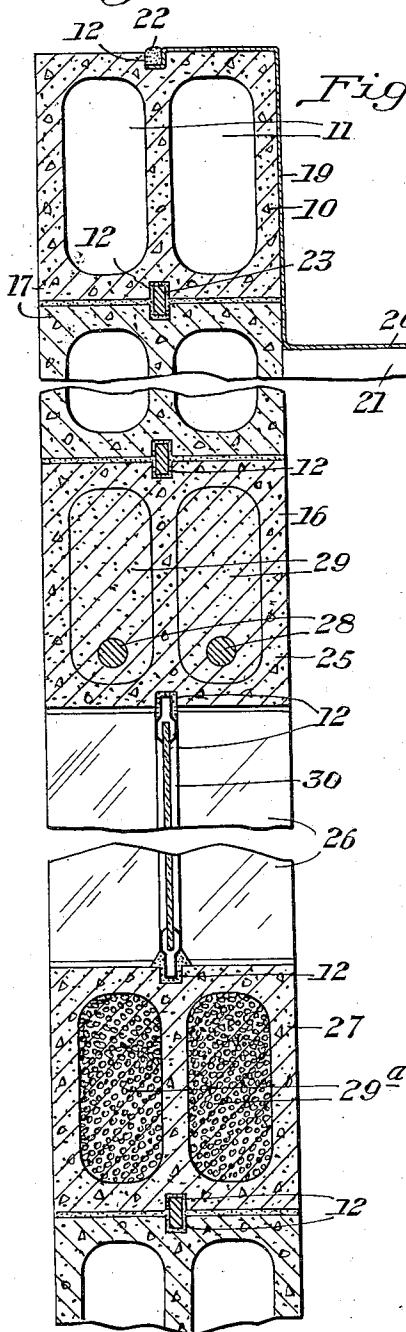
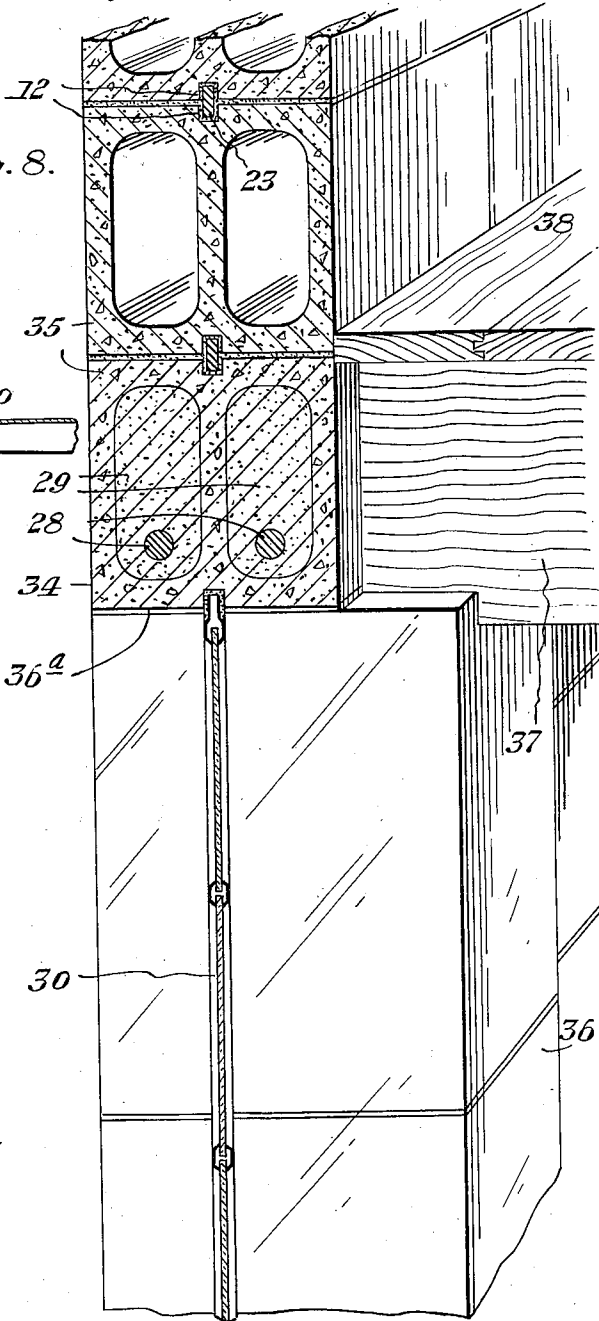


Fig. 8.



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## UNITED STATES PATENT OFFICE

1,968,393

## BUILDING UNIT

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Application July 16, 1931, Serial No. 551,155

8 Claims. (Cl. 72-41)

My invention relates to a building unit and, in particular, to a precast concrete block adapted to serve a variety of purposes in the construction of a building wall.

In my co-pending application, Serial No. 555,042, filed August 4, 1931, for Building construction, I have described and claimed a wall construction utilizing blocks such as described and claimed here.

According to present practices, a plurality of types of precast concrete blocks are necessary in the construction of a building wall. In the first place, the ordinary blocks for composing the body of the wall are required in considerable numbers. Other types of blocks are necessary in smaller numbers to form the coping at the top of the building wall, lintels over doors and windows, sills for windows and doors and mullions or jams for windows. Special types of blocks are required, not only for the various purposes mentioned but special corner blocks are necessary, in order to present a finished surface at a corner of the wall. The provision of all these special types of blocks naturally increases the cost of construction and, furthermore, introduces difficulty in matters of handling and stocking a supply of blocks.

Another objection to present types of blocks used in building walls is that the voids in the blocks are generally disposed vertically, so that there is only a slight area available for receiving the mortar, which increases the difficulty of laying up the blocks rapidly.

I have invented a novel type of block for building walls which overcomes all the aforementioned disadvantages. In accordance with the invention, I provide a building block of rectangular cross-section, having voids extending axially thereof from one end to a point adjacent the other end. The voids do not extend clear through the block and, therefore, a smooth, finished surface is presented at one end of the block. Opposite faces of the block are provided with a longitudinal recess which, like the voids in the block, terminates short of the other end thereof. If desired, the recesses may be made continuous by chipping out the material closing the end thereof. As hereinafter described, this block can be used satisfactorily for coping sills, lintels, jambs, and mullions, as well as for other purposes which will be pointed out.

Generally, the block is positioned in the wall so that the voids extend horizontally, although, in some cases, it will be positioned vertically. In most cases, therefore, a smooth, continuous sur-

face is provided for receiving the mortar between courses.

For a complete understanding of the invention, reference is made to the accompanying drawings, in which

Figure 1 is a perspective view of one style of block according to the present invention;

Figure 1a is a similar view of a further form of block;

Figure 2 is a similar view, showing a slightly modified form of block;

Figure 2a is a partial sectional view along the line II—II of Figure 1;

Figure 3 is a side elevational view of a building wall composed of blocks made according to the present invention;

Figure 4 is a sectional view, largely diagrammatic, along the line IV—IV of Figure 3;

Figure 5 is a view similar to Figure 4 to an enlarged scale;

Figure 6 is a sectional view, taken transversely through a mullion between adjacent windows;

Figure 7 is a view similar to Figure 6, showing a modified form of block used as a mullion; and

Figure 8 is a sectional view through a building wall, showing how the different forms of blocks may be combined for certain purposes.

Referring now in detail to the drawings, Figure 1 shows a precast concrete block 10 for use in building walls. The block is a rectangular cross-section and in the particular example shown in Figure 1, the cross-section of the block is square. Voids 11 extend longitudinally of the block from one end thereof to a point adjacent the other end. One end of the block, therefore, is closed by a wall 10' and has a continuous finished surface. Preferably, the thickness of the end and side walls of the block is about  $\frac{3}{4}$ ". Longitudinal recesses 12, in opposite faces of the block, extend from one end to a point about the same distance from the closed end of the block. These longitudinal recesses may have either straight or sloping sides, as shown in Figure 1a. If a plurality of blocks are positioned end to end, the small amount of material closing the recesses or grooves 12 can be chipped out in order to provide a continuous passage where desired. Similarly, the closed ends of the blocks may be punched out if, for example, it is desired to pass reinforcing rods through a plurality of blocks end to end and to fill the voids therein with grout for a purpose to appear hereinafter.

Figure 1a shows a different form of block 10a, in which only one void is provided. The walls of this block are slightly thicker than that shown

in Figure 1, but the exterior dimensions are the same. The top wall is thickened opposite the recess 12 to compensate for the decreased thickness of the wall due to the formation of the recess. The void and the recess extend through the entire length of the block 10a.

Figure 2 is a view similar to Figure 1, showing a slightly modified form of block. The block 13, shown in Figure 2, has voids 14 therein and grooves 15 formed in the wide faces of the block. The block is also provided with an end drain groove 15a. The block is rectangular in cross-section and is wider than it is thick. The grooves 15, however, are spaced from one of the narrow faces of the block by substantially the same distance as in the case of the block shown in Figure 1. It is thus possible to combine the different forms of blocks without interfering with the alinement of the grooves 12 and 15. Referring now to Figures 3 through 8, certain applications of the invention will be illustrated.

Figure 3 shows a corner in a building wall composed of blocks of my invention. As shown in Figure 3, a side wall 16 of a building is composed of a plurality of courses 17, comprising blocks, such as those shown in Figures 1 and 2, laid up end to end with a suitable thickness of mortar therebetween. It will be noted first that the ends of the blocks 18, extending at right angles to the wall 16, present a smooth, closed, finished surface in the plane of the latter which harmonizes therewith and produces a corner of pleasing appearance without the necessity of special corner blocks. If desired, of course, the exposed surfaces of the blocks in the wall 16 may be provided with a roughened surface, instead of a smooth surface, and the ends of the blocks 18 may be correspondingly treated.

The top course 17 constitutes the wall coping, as shown in Figures 4 and 5, so that no special form of block is necessary for the coping. The groove 12 in the blocks 10 here performs a useful function. Flashing 19, extending upwardly from a roof 20, supported on beams 21 is seated in the groove 12. The groove is then filled with waterproof cement 22. The beams 21 may be embedded in the wall 16. The grooves 12 between adjacent courses 17 may be filled with asphalt 23 for the purpose of weather-stripping the joint and making it waterproof.

A window opening 24 in the wall 16 is provided by a plurality of blocks 10 built into the walls to form a lintel 25, jambs 26, and a sill 27. In order to support the blocks comprising the lintel, the closed ends of a number of adjacent blocks are punched out, as above described, so that reinforcing rods 28 may be passed through the voids in the blocks and the latter filled with grout 29. This operation produces a solid concrete beam across the top of the window opening, which has ample strength to carry the load of the blocks thereabove.

The groove 12 in the bottom surface of the blocks composing the lintel 25, together with similar grooves in the blocks composing the jambs 26 and the sill 27, are adapted to receive the edges of a steel sash 30 for closing the window openings. The sash, of course, may be of any desired type. The sash is secured in the grooves by means of a cement filling inserted in the latter. It will be apparent that where two blocks abut end to end, the groove must be made continuous by chipping out the material closing one end of the groove in each block.

Figures 4 and 5 illustrate how the block may be

employed as window sills, jambs, and lintels. Figures 6 and 7 show how the same blocks may serve as mullions between adjacent windows. As indicated in Figures 6 and 7, a plurality of blocks, similar to those shown in Figures 1 and 2, may be placed vertically end to end, as indicated in Figures 3 through 5, to constitute a mullion 31. The grooves in opposite faces of the blocks receive the edges of the steel sash 30, as described in connection with Figure 5. In order to provide the desired rigidity in the mullion, the closed ends of the blocks constituting the latter may be punched out to receive reinforcing rods 32 and grout 33 in the manner already described to form a solid concrete column or mullion.

Figure 8 illustrates how the two types of blocks shown in Figures 1 and 2 may be combined in a building wall. As shown in Figure 8, a wall 34 is composed of a plurality of courses 35 of blocks 10. The outer surfaces of the blocks are in alinement so that the wider blocks in the pilaster 36 project inwardly of the inner faces of the blocks in the course 35. The projecting blocks in the pilaster 36 form a shoulder for receiving floor joists 37 which support a floor 38. In the example shown in Figure 8, the course 36 also serves to provide a lintel for a window opening 36a in the wall 34. It will be noted that the voids in the lintel constituted by the course 36 are provided with reinforcing rods and a grout filling to give the beam effect already described.

It will also be apparent that combinations of the blocks of different thicknesses may be worked out to provide a pilaster effect upon the exterior of the building wall. The wider blocks may be positioned in the wall so that they project on the outside thereof instead of on the inside, as shown in Figure 8, to accomplish this result.

It will be apparent from the foregoing description that the invention provides means for constructing a building wall without the necessity of providing special types of blocks for performing different functions in the wall. The same blocks provide a finished corner in the wall, as well as the coping at the top of the wall, and the sills, jambs, and lintels of window openings. When used as coping, the blocks are adapted to cooperate with the flash extending over the edge of the roof. The jambs, lintels, and sills are adapted to receive window sash and the blocks may be also assembled mullions between windows. By combining courses of different widths, a seat for floor beams may be provided in a wall or a pilaster effect on the exterior of the wall.

The invention also provides means for constructing building walls at lower cost than has heretofore been possible and also increases the convenience and speed with which the erection can be carried on.

Another important advantage of the invention is that blocks may be cheaply constructed in large quantities. Apparatus suitable for manufacture is disclosed in my copending application, Serial No. 408,988, filed November 22, 1929, for Apparatus for manufacturing cementitious articles. This apparatus may be employed to mold the blocks endwise and a double layer of blocks positioned endwise may be molded in one operation. The blocks may be made of any desired length and the width and thickness may likewise be varied. It will be found desirable, however, to adhere to certain standards for the dimensions of the blocks.

As will be apparent, the voids or holes in the blocks may be filled with any desirable insulating

material, such as expanded concrete. In Figure 5, I have shown the voids in one of the blocks as filled with expanded concrete, as indicated at 29a. When the blocks are so filled, a perfectly insulated structure will be obtained.

Although I have illustrated and described herein but a single present preferred embodiment of the invention and a slight modification thereof, together with certain of the uses to which it may be put, the invention may be practiced in other forms or applied to other purposes without departing from the scope of the appended claims.

I claim:

1. As an article of manufacture, a building block having a length twice as great as its height, longitudinal holes extending through said block from one end thereof, a continuous wall at the other end of the block and grooves in the top and bottom walls of the block extending from one end thereof almost to the other end, the closed ends of said grooves being adapted for punching out to connect the grooves with those in an adjacent block.

2. As an article of manufacture, a building block having a length greater than its height, one end of said block being closed, a hole extending longitudinally of the block from the other end, and a groove in one face of the block terminating short of the closed end thereof.

3. As an article of manufacture, a building block, a longitudinal groove in one wall of the block extending along the length thereof from one end, a wall closing the groove at the other end of the block, the groove-closing wall being of such thickness as to be adapted to be punched out for communication with a similar groove in an adjacent block.

4. As an article of manufacture, a building block having a height substantially one-half its

length, a longitudinal groove in one surface of said block, said groove extending from one end of the block, and a knock-out wall closing the other end of the groove.

5. As an article of manufacture, a building block having a height substantially one-half its length, a longitudinal hole in said block extending from one end thereof, a wall for closing the other end of the block, a groove in a surface of the block extending from one end thereof, said hole-closing wall having a portion for closing the other end of said groove.

6. As an article of manufacture, a building block having a longitudinal hole and two plane side surfaces, a longitudinal groove substantially centrally of a third face for receiving a metal sash, and an end wall closing said hole and said groove.

7. As an article of manufacture, a building block having a plurality of plane faces adapted to be exposed when the block is laid in a wall, a hole extending through the block from one end, an end wall adjacent the other end of the block, other faces of the block having recesses extending longitudinally thereof and positioned centrally of said hole, with their ends closed by said end wall.

8. As an article of manufacture, a building block having a length twice as great as its height whereby it may be laid up horizontally and vertically with matching joints and having an end wall, a continuous hole extending longitudinally through said block from one end to said end wall, the end wall being adapted to be punched out to communicate with the open end of an adjacent block, and a longitudinal groove in one face of the block with one end closed by said end wall.

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