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BUILDING BLOCK

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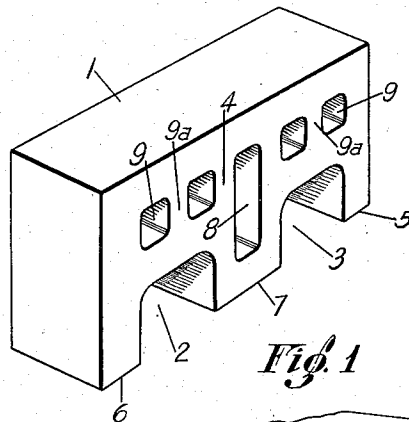


Fig. 1

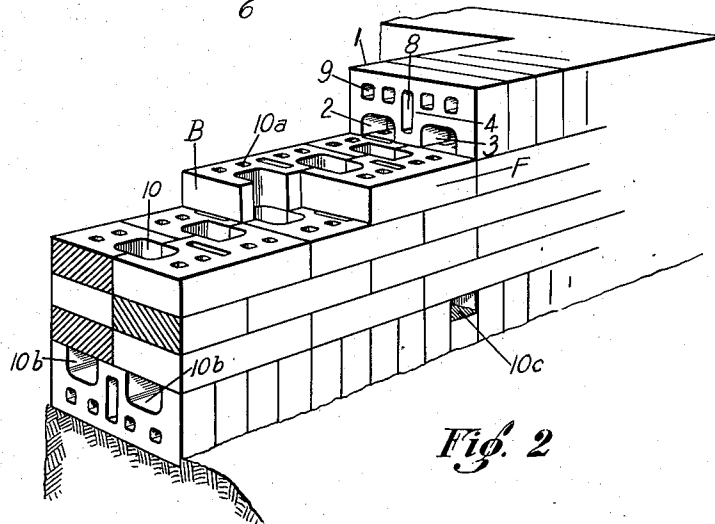


Fig. 2

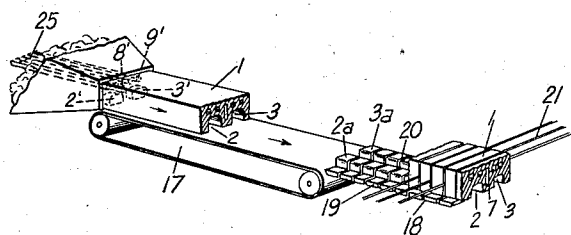


Fig. 3

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BUILDING BLOCK

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7 Claims. (Cl. 72-41)

My invention relates to building bricks or blocks and method of producing the same. It has to do, more particularly, with a brick or block adapted to be used for building purposes and which is particularly adaptable to present-day building conditions.

There have been many attempts to devise a brick or building block adapted to replace the standard type of brick which is now extensively used and which has been extensively used for years. However, none of the bricks or blocks which have been devised up to the present time has possessed as many desirable features as the standard type of brick possesses. The extensive use of the standard type of brick is due mainly to its durability, simplicity, strength and its flexibility in use. None of the bricks or blocks hitherto devised to replace the standard brick has possessed these features in the same degree as they are possessed by the standard brick.

Although the standard type of brick possesses numerous advantageous features, it is quite desirable that the weight of the brick be reduced, provided this can be effected while retaining the said numerous advantageous features. Thus, the transportation charges are material factors in the use of the brick and the labor cost in handling is also a factor.

Likewise, if this type of brick is used in a large building, it is necessary to provide a comparatively strong and, therefore, costly supporting structure for the walls because of the weight of the brick. Furthermore, when brick of this type is incorporated in a wall structure, hollow tile is often used to provide greater insulation and reduce the weight and cost of the wall. Likewise, when brick of this type is used in a wall structure, due to the fact that the mortar in such structure sometimes shrinks, the seams therein tend to open and permit moisture to enter thereinto. Since no drainage is provided for in a wall structure made up of these bricks, the moisture sometimes penetrates to the interior of the finished wall with harmful results.

Some of the attempts to devise a brick or building block adapted to replace the standard type of brick which is now extensively used and which is quite advantageous, because of its simplicity, strength and flexibility in use, have involved the production of cored bricks. Ordinarily, however, the cores or openings in these bricks have consisted of a few unduly large openings, with a tendency towards inadvertently filling of such openings with mortar.

Other attempts have resulted in products having high initial costs and in products deficient in strength and lasting qualities. In many cases, the products were of such form as to require several different shapes for the production of a complete wall structure, with resultant difficulties in estimating and handling difficulties with increased wastage.

One of the objects of my invention is to provide a brick or building block which possesses all the desirable features of the standard type of brick but which has certain additional advantageous features.

Another object of my invention is to provide a brick or building block which will be comparatively light in weight while still possessing ample strength.

Still another object of my invention is to provide a brick or building block which will be simple and inexpensive to manufacture and which will possess a great amount of flexibility in use.

A further object of my invention is to provide a brick or building block of such a type that when a wall is made up of bricks or blocks of this type a great amount of dead air space will be produced therein, which will serve as an insulating medium and a plurality of drainage channels will also be produced in the wall.

A still further object of my invention is to provide a method of producing bricks or blocks of the type indicated in an efficient and economical manner.

In its preferred form, my invention contemplates the provision of a brick which is made of standard size. This brick is provided with cut out portions at the back thereof and several apertures cored through the body portion thereof so that its weight will be reduced substantially while still maintaining ample compressive strength. The amount or percent that this brick can be reduced in weight will vary depending upon the different qualities of clay used and the manner in which the bricks are produced. When a wall structure is made up of these bricks, a plurality of dead air spaces will be formed therein and will serve as an insulating medium and a plurality of drainage channels will also be formed therein. These drainage channels will conduct any moisture which might seep into the wall to a desired point.

The preferred embodiment of my invention is shown in the accompanying drawing wherein similar characters of reference designate corresponding parts and wherein:

Figure 1 is a perspective view of a preferred

form of brick which is made in accordance with my invention.

Figure 2 is a perspective view of a wall structure having bricks, made in accordance with my invention, incorporated therein.

Figure 3 is a diagrammatic view illustrating the method which I preferably use in producing bricks of the type contemplated by my invention.

With reference to the drawing and, particularly, to Figure 1, I have shown a brick 1 made in accordance with my invention. This brick is preferably made of standard size and of any suitable material.

In Figure 1, I have shown the brick laid on one of its side edges. It will be understood that the upper surface of the brick, as shown in Figure 1, will be the face of the brick when it is incorporated in a wall structure and the side on which the brick is resting will be the back of the brick.

The back of the brick is provided with cutaway portions 2 and 3 which extend entirely through the brick from top to bottom. These cutaway portions are both preferably of the same width and each of these cutaway portions is spaced an equal distance from the corresponding end of the brick. Furthermore, these cutaway portions extend back into the brick a considerable distance but preferably extend a distance which is less than one-half the depth of said brick. By the term "depth of the brick" I means the distance from the face of the brick to the back of such brick.

As shown in the drawing, when the cutaway portions 2 and 3 are formed in the brick, a body portion 4 is formed which extends the entire length of the brick and is preferably greater in width than one-half the depth of the entire brick. From a point adjacent each end of the body portion 4 and projecting rearwardly therefrom, are formed outwardly extending portions 5 and 6. These portions 5 and 6 are of equal width. An outwardly extending portion 7 is also formed midway between the length of the member 4. This portion 7 is substantially twice as wide, plus the width of a mortar joint, as each of the portions 5 and 6, for a purpose which will be hereinafter apparent.

In addition to the cutaway portions 2 and 3 which are formed in the brick, several other apertures which extend through the brick are formed. As shown in Figure 1, a slot 8 extending through the brick is formed partly in the body portion 4 of the brick and partly in the rearwardly extending portion 7. This slot 8 extends almost the entire depth of the brick and is disposed midway between the length thereof.

As previously stated, the body portion 4 of the brick is greater than one-half the depth of such brick. The brick is made in this manner to provide stability and so that a plurality of small vertical apertures which extend through the brick may be formed in the body portion 4 without reducing the strength of the brick beyond safe limits. I have shown four of these apertures 9 formed therein but, obviously, I am not limited to this number. These apertures 9 are disposed in a single row, substantially midway between the face of the brick and the inner walls of the cutaway portions 2 and 3. A pair of these apertures 9 is formed on each side of the slot 8. A rib 9a separates the apertures 9 of each pair. However, these ribs 9a could be eliminated if desired and slots similar to the slot 8 could be formed, which would extend longitudinally of the brick on each side of the said slot 8.

It will be understood from this description and from reference to the accompanying drawing, that a brick embodying the principles of my invention will have load-bearing portions at each end which extend for the entire depth of the brick, which is preferably of standard size. It will also be understood that a similar load-bearing portion is provided midway between the length of the brick but this portion is substantially twice as wide, plus the width of a mortar joint, as the load-bearing portions disposed at each end of the brick. Thus, at all load-bearing points, my brick will be of the same depth as a standard brick. This will, therefore, give a wall which is made of my brick, the same stability as if it were made of standard brick.

It will be apparent that a brick of the type described could be used with any standard brick, either for facing or backing purposes and is preferably used in combination for both purposes. It will also be apparent that either or both of the apertures 9, and the slot 8 may be eliminated if desired.

In Figure 2, I have shown a wall structure made up of a row of backing bricks B and a row of facing bricks F. All of these bricks are identical in structure to that shown in Figure 1.

The front row of bricks is laid in such a manner that the cutaway portions 2 and 3 thereof will correspond to the corresponding cutaway portions 2 and 3 of the back row of bricks. Thus, vertical passageways 10 of comparatively great cross-section are formed in the wall structure. Furthermore, all the different layers of bricks are laid in standard running bond and passageways 10 in the lower layer of bricks will correspond to the passageways 10 formed in the layer next above. Thus, the wall structure will have passageways 10 extending the entire height thereof. These passageways will form dead air spaces which serve as insulating medium for the wall structure. Likewise, these passageways will serve to drain off any moisture which might seep into the wall, due to the shrinkage of mortar or to any other factor.

The layers of brick will also be so disposed relative to each other that the apertures 9 of bricks in the bottom layer will correspond to the apertures 9 of the bricks in the layer next above. In this manner, a plurality of small vertical passageways 10a will be produced in the wall structure by the apertures 9. These passageways, since the mortar at these points is not dense or compressed, serve as drainage passageways and, also, as dead air spaces. When the mortar is placed on the bricks, it is placed along the forward portion thereof and a part of it will key both up and down into these apertures 9 and serve to more firmly anchor the layers of brick together.

Since the rearwardly projecting portion 7 at the middle of the brick is substantially twice as wide, plus the width of a mortar joint, as each of the projecting portions 5 and 6 at the ends of the brick, the front row of bricks may be disposed in over-lapping relation to the back row of bricks, and the cutaway portions 2 and 3 of the front row will align with the corresponding portions 2 and 3 of the back row. Likewise, because of this structure of the brick, the bricks of the adjacent layers of the wall may be disposed in over-lapping relation and the corresponding cutaway portions 2 and 3 of the bricks of different layers will correspond with each other. The apertures 9 of the different layers of brick will correspond with each other, due to this structure.

As shown in Figure 2 of the drawing, the bricks of the lowermost course are laid transversely of the row of facing brick and the row of backing brick. This is commonly known in the trade as a rowlock course and serves to join the front part of the wall to the rear part of the wall. Furthermore, since the lowermost course of bricks is laid in this manner, it serves to close the lower ends of all the vertical passageways in the wall. Likewise, a plurality of horizontal drainage troughs 10b is formed by arranging the lowermost course of bricks in this manner and these troughs communicate with the vertical passageways in the wall. Thus, any moisture seeping into the wall, as during a severe storm, will pass downwardly through the vertical channels in the wall and then into the horizontal drainage troughs 10b, by means of which the moisture may be conducted to any desired point. If desired, one end of one or more of the bricks may be broken off, as shown at 10c, so that the moisture may be drawn off from the drainage troughs. A drain may be connected to the wall through the medium of the passage formed by breaking off the end of the brick.

A similar rowlock course of brick may also be laid at the top of the wall structure. These bricks are also laid transversely of the wall and on edge but with the cutaway portions 2 and 3 disposed on the lower surface thereof. Thus, the upper ends of all the vertical passageways in the wall structure will be closed by the course of bricks which are arranged in this manner.

When brick of the type described are used in a wall structure, it is not necessary to have a special shape for the corners. It will also be apparent that a half of my brick may be used when desired. The slot 8 extends substantially the entire depth of the brick, substantially midway between the ends, so that the brick may be readily broken into halves with a trowel or hammer.

In Figure 3, I have illustrated diagrammatically the preferred method which I employ in producing my bricks. With this method, the clay is first mixed as in the well known "stiff mud" process and is placed in a suitable container. This container is provided with a die 16 through which the plastic clay is adapted to be forced in a well known manner. This die is slightly greater in height and width than the depth and length of the bricks which are to be produced. The lower portion of the die is provided with upwardly projecting members 2' and 3'. These projecting members are adapted to produce the cutaway portions 2 and 3 in the brick. A plurality of bars 9' and a bar 8' which are rigidly supported at their rear ends on a suitable support 25 have their forward ends projecting forwardly into the die 16. These bars are adapted to produce the apertures 9 and the slot 8 in the brick.

It will be apparent that, when the plastic clay is forced through the die, it will first pass around the support 25 for the bars 8' and 9'. Then, after the clay passes the support, it will completely envelop the bars 8' and 9'. When the clay is forced through the opening in the die, a slab of clay will be produced which will be slightly wider and thicker than the length and depth of the brick to be finally produced. Because the opening in the die is provided with the members 2' and 3' projecting therein and the ends of the bars 8' and 9' projecting therein, the slab of clay will have the cutaway portions 2 and 3 on the under surface thereof and a slot 8 and aperture 9 extending throughout the length thereof. It will be ap-

parent, however, that either or both the bars 8' and the bars 9' may be eliminated from the die in order to produce different types of bricks.

When the slab of clay emerges from the die 16, it passes onto a belt conveyer 17 which conveys it to a cutting table 18. This cutting table 18 is divided into several portions 19 which are separated by slots 20. These portions 19 are slightly greater in width than the thickness of the brick to be produced. The portions 19 are provided with upwardly projecting members 2a and 3a which are adapted to fit within the cutaway portions 2 and 3 of the slab of clay.

It will be apparent that the slab of clay will move along the conveyer 17 and will be moved onto the cutting table 18. When the slab of clay moves onto the cutting table, the cutaway portions 2 and 3 thereof will fit over the upwardly extending portions 2a and 3a of the members 19. The members 2a and 3a will prevent distortion of the slab of clay during the cutting operation. The cutting operation may be performed in any suitable manner, as by a plurality of wires 21 which are spaced apart a distance equal to the width of the members 19. These wires pass down through the slab of clay and then down into the slots 20 so that the slab of clay will be completely cut into a number of bricks.

It will, likewise, be apparent that a series of upwardly extending segments, similar to members 2a and 3a, may be applied to the conveyer 17 to fit into the portions 2 and 3 of the slab of clay as it emerges from the die, and to support the slab at these points. These members on the conveyer may be necessary if a delicate clay, which requires careful handling, is being used in producing the bricks.

The bricks which are produced in this manner will be slightly greater in dimensions than the brick to be produced. Likewise, the slot 8 is also formed in the brick. The brick may then be burned and, during the burning, the brick will shrink slightly so that the finally completed brick, shown in Figure 1, of the proper size will be produced. It will be obvious that the burning of the brick will be facilitated because of the cutaway portions 2 and 3, the aperture 9 and the slot 8, and that there will be less tonnage to burn and, consequently, a saving in fuel.

When certain qualities of clay are used in producing my brick, it may be desirable to employ the recently developed process of "de-airing" the clay while it is being formed, in conjunction with the method which I preferably use for producing brick of the type contemplated by my invention. Thus, during the time the clay is forced from the container through the die 16, the air may be constantly withdrawn from the container and a vacuum may be maintained therein so that the clay will be "de-aired" during the time it is being shaped. It has been found that by drawing the air from the clay during forming, the compressive strength of the brick produced is increased substantially.

It will be understood from the preceding description that I have provided a brick which is particularly adaptable to present-day building conditions. The bricks which I have devised, while still possessed of ample strength, are comparatively light in weight. Because of the fact that my brick is very light in weight, transportation and freight costs which are incurred in shipping the bricks from the manufacturer to the jobber or to the consumer are comparatively less.

Likewise, labor costs are small, since bricks made in accordance with my invention may be more readily handled and the brick-layer will not become fatigued so quickly and will be able to lay more bricks per day. Another advantageous feature of my brick, due to its light weight, is the fact that when bricks made in accordance with my invention are used, especially in large building structures, it will not be necessary to provide such strong and costly supporting structures for the walls.

My brick is also of such a structure that, when it is incorporated in a wall structure, a great amount of dead air spaces will be formed which will serve as an insulating medium for the wall structure. Likewise, when my brick is used in a wall structure, a plurality of vertical drainage channels will be produced which tend to convey any moisture which might seep into the wall structure to the bottom of said structure where the horizontal drainage troughs will conduct it to a desired point.

As previously stated, my brick is formed in such a manner that it will have full standard brick width at all load-bearing points, thereby giving substantially as much strength and stability to a wall composed of such brick as if it were composed of standard brick. Furthermore, this brick may be used with any standard brick, either for facing or backing purposes, or preferably in combination for both purposes. The flexibility of use of my brick is substantially as great as that of the standard type of brick. It is only necessary to provide one shape of brick and special shapes for corners or other purposes are not required.

It will be apparent that although I have described my brick as being of standard size, the principles of my invention may be embodied in bricks or blocks of any desired size, and by the term "brick" used in the specification, I intend to cover such bricks or blocks.

Having thus described my invention, what I claim is:

1. A building block having a pair of cutaway portions on the rear side thereof with the outer sides of said cutaway portions open, said cutaway portions extending through the entire thickness of the block but extending forwardly into the block a distance less than one-half the depth of the block so that a body portion which extends the entire length of said block and which is greater in depth than one-half the depth of said block throughout its length is formed, said body portion being provided with rearwardly extending portions at each end and a rearwardly extending portion midway between its ends, the rearwardly extending portion disposed midway between the ends of the block being slightly greater in width than twice the width of each of the end extending portions, a slot formed midway between the ends of said block for facilitating cutting or breaking thereof into halves, part of the said slot being formed in said body portion of the block and part being formed in said rearwardly extending portion which is disposed midway between the ends thereof and extending entirely through the thickness of the block, the said slot having both its rear end and its forward end closed and extending from a point spaced slightly from the face of said block to a point spaced slightly from the rear extremity of said last-named rearwardly extending portion, and a plurality of spaced openings formed in said block at each side of said slot and extending through the

entire thickness thereof, all the walls of said block with the exception of the walls between the adjacent spaced openings being of substantially uniform thickness.

2. A building block having a pair of cutaway portions on the rear side thereof with the outer sides of said cutaway portions open, said cutaway portions extending through the entire thickness of the block but extending forwardly into the block a distance less than one-half the depth of the block so that a body portion which extends the entire length of said block and which is greater in depth than one-half the depth of said block throughout its length is formed, said body portion being provided with rearwardly extending portions at each end and a rearwardly extending portion midway between its ends, the rearwardly extending portion disposed midway between the ends of the block being slightly greater in width than twice the width of each of the end extending portions, a slot formed midway between the ends of said block for facilitating cutting or breaking thereof into halves, part of the said slot being formed in said body portion of the block and part being formed in said rearwardly extending portion which is disposed midway between the ends thereof and extending entirely through the thickness of the block, the said slot having both its rear end and its forward end closed and extending from a point spaced from the face of said block to a point spaced from the rear extremity of said last-named rearwardly extending portion, and openings formed in said block at each side of said slot and extending through the entire thickness of said block.

3. A building block having a pair of cutaway portions on the rear side thereof with the outer sides of said cutaway portions open, said cutaway portions extending through the entire thickness of the block but extending forwardly into the block a distance less than one-half the depth of the block so that a body portion which extends the entire length of said block and which is greater in depth than one-half the depth of said block throughout its length is formed, said body portion being provided with rearwardly extending portions at each end and a rearwardly extending portion midway between its ends, the rearwardly extending portion disposed midway between the ends of the block being slightly greater in width than twice the width of each of the end extending portions, a slot formed midway between the ends of said block for facilitating cutting or breaking thereof into halves, part of the said slot being formed in said body portion of the block and part being formed in said rearwardly extending portion which is disposed midway between the ends thereof and extending entirely through the thickness of the block, the said slot having both its rear end and its forward end closed and extending from a point spaced from the face of said block to a point spaced from the rear extremity of said last-named rearwardly extending portion.

4. A building block having cutaway portions on the rear side thereof with the outer sides of said cutaway portions open, said cutaway portions extending through the entire thickness of the block but extending forwardly into the block a distance less than one-half the depth of said block so that a body portion which extends the entire length of said block and which is greater in depth than one-half the depth of said block throughout its length is formed, said body portion being provided with rearwardly extending portions at each end there-

of and a rearwardly extending portion between the end rearwardly extending portions, the rearwardly extending portion which is disposed between the end rearwardly extending portions being slightly greater in width than twice the width of each of the end extending portions, a slot formed in said block for facilitating breaking or cutting thereof, part of the said slot being formed in the body portion of the block and part being formed in said rearwardly extending portion which is disposed between said end rearwardly extending portions, the said slot having both its rear end and its forward end closed and extending from a point spaced from the face of said block to a point spaced from the rear extremity of said rearwardly extending portion which is disposed between said end rearwardly extending portions.

5. A building block having cutaway portions on the rear side thereof with the outer sides of said cutaway portions open, said cutaway portions extending through the entire thickness of the block and extending forwardly into the block a suitable distance so that a body portion is formed which extends throughout the length of said block and which is of substantial depth throughout its length, said body portion being provided with rearwardly extending portions at each end thereof and a rearwardly extending portion between the end rearwardly extending portions, the rearwardly extending portion which is disposed between the end rearwardly extending portions being slightly greater in width than twice the width of each of the end extending portions, a slot formed in said block for facilitating breaking or cutting thereof, part of the said slot being formed in the body portion of the block and part being formed in said rearwardly extending portion which is disposed between said end rearwardly extending portions, the said slot having both its rear end and its forward end closed and extending from a point spaced from the face of said block to a point spaced from the rear extremity of said rearwardly extending portion which is disposed between said end rearwardly extending portions.

6. A building block having cutaway portions on the rear side thereof with the outer sides of said cutaway portions open, said cutaway portions extending through the entire thickness of the block but extending forwardly into the block a distance less than one-half the depth of said block so that a body portion is formed which extends for the entire length of said block and which is greater in depth than one-half the depth of said block throughout its length, said body portion being provided with rearwardly extending portions at each end thereof and a rearwardly extending portion between the end rearwardly extending portions, the rearwardly extending portion which is disposed between the end rearwardly extending portions being slightly greater in width than twice the width of each of the end extending portions, and a slot formed in said block for facilitating cutting or breaking thereof, said slot extending from a point adjacent the face of the block towards the rear side of said block and extending through the entire thickness of the block, the front and rear ends of said slot being closed.

7. A building block having cutaway portions on the rear side thereof with the outer sides of said cutaway portions open, said cutaway portions extending through the entire thickness of the block but extending forwardly into the block a distance less than one-half the depth of said block so that a body portion is formed which extends for the entire length of said block and which is greater in depth than one-half the depth of said block throughout its length, said body portion being provided with rearwardly extending portions at each end thereof and a rearwardly extending portion between the end rearwardly extending portions, the rearwardly extending portions which is disposed between the end rearwardly extending portions being slightly greater in width than twice the width of each of the end extending portions, the outermost extremities of all of said rearwardly extending portions being solid or continuous.

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