Jan. 22, 1924. 1,481,249

E. J. BEINECKE

HOLLOW BUILDING TILE

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Fig. 1

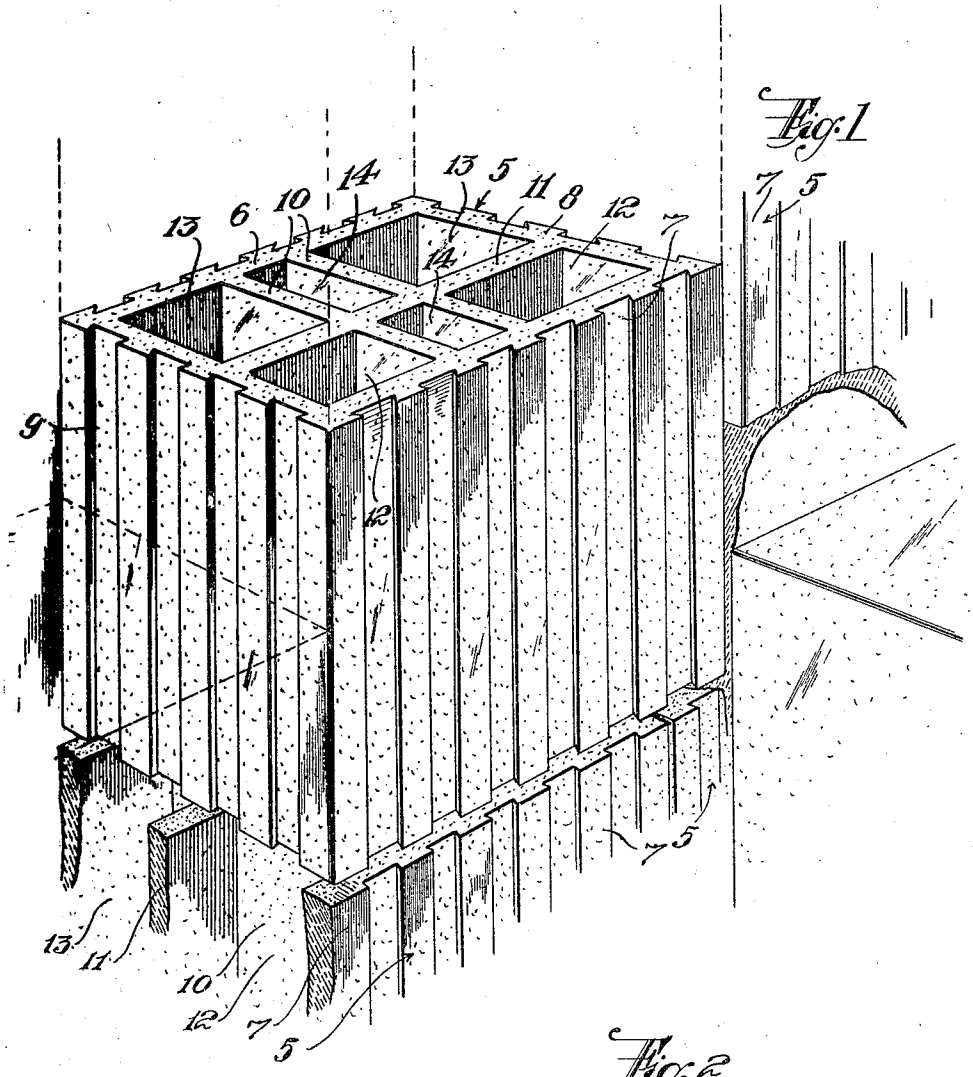
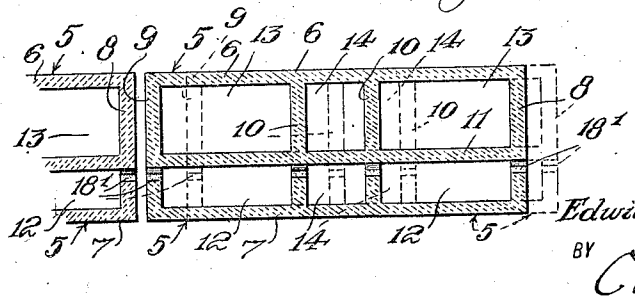


Fig. 2



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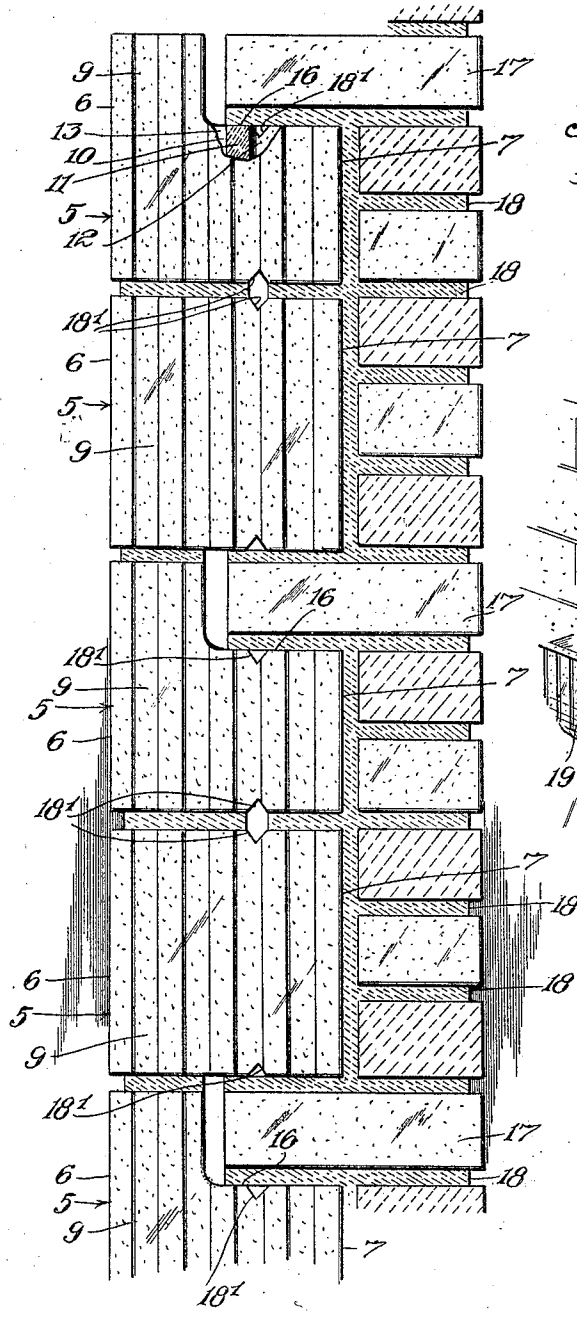
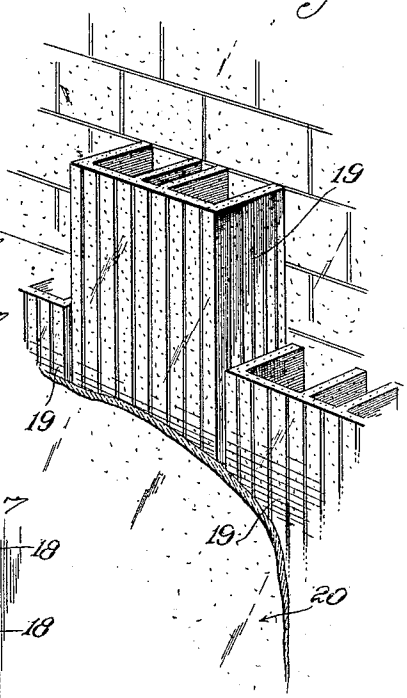


Fig. 3

Fig. 6



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Fig. 4.

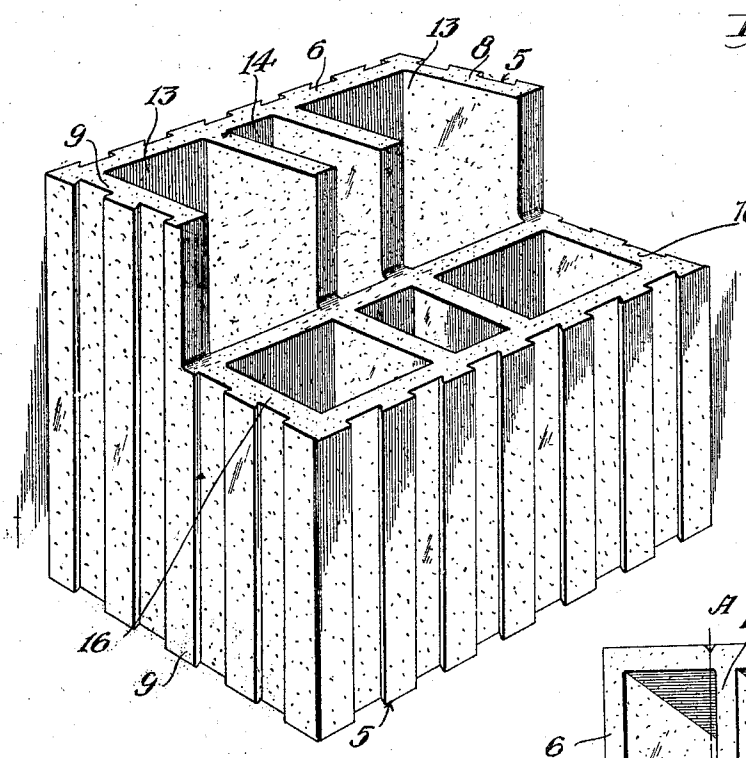


Fig. 10.

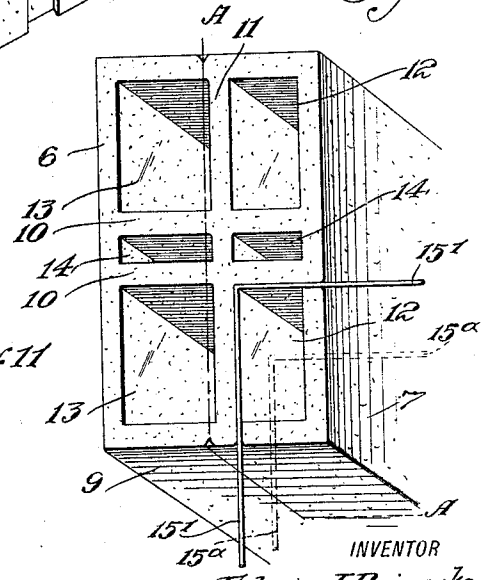
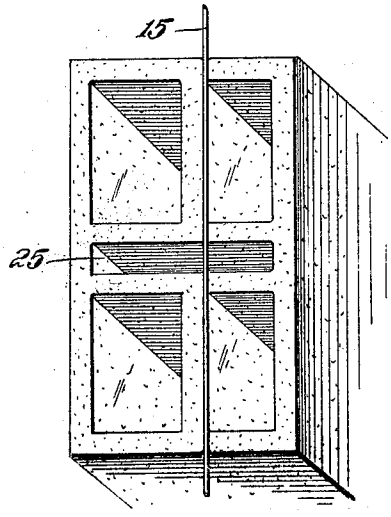


Fig. 11.



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Fig. 5

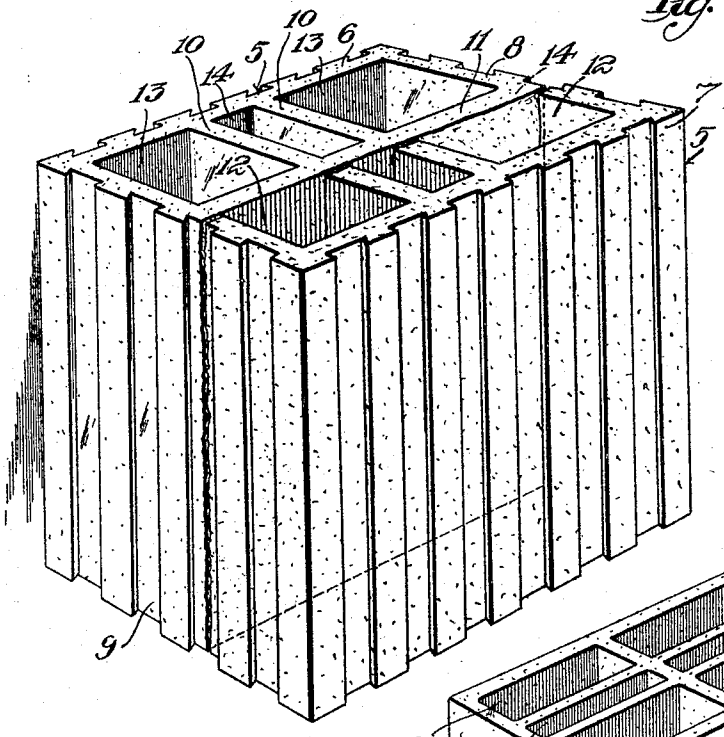


Fig. 12

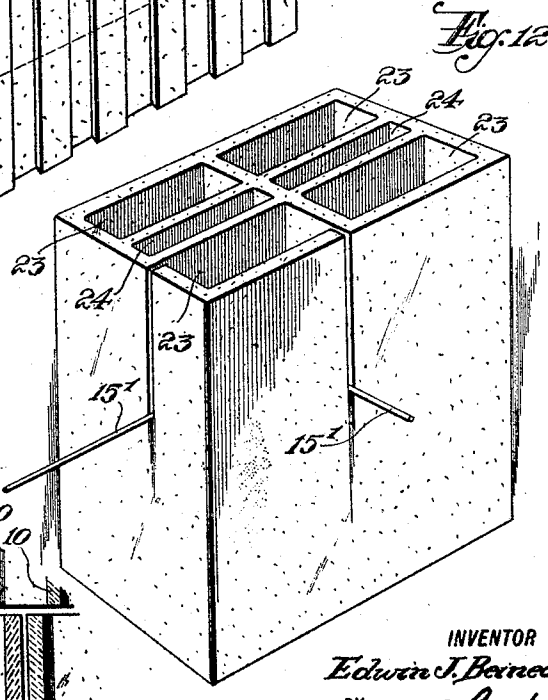
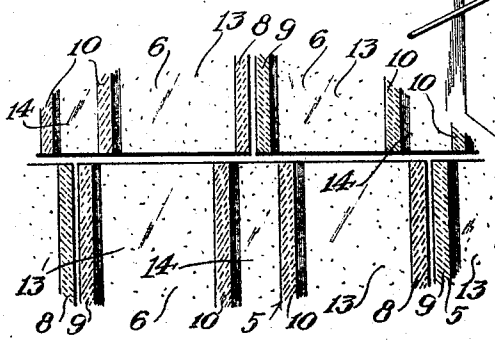


Fig. 9



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Fig. 7

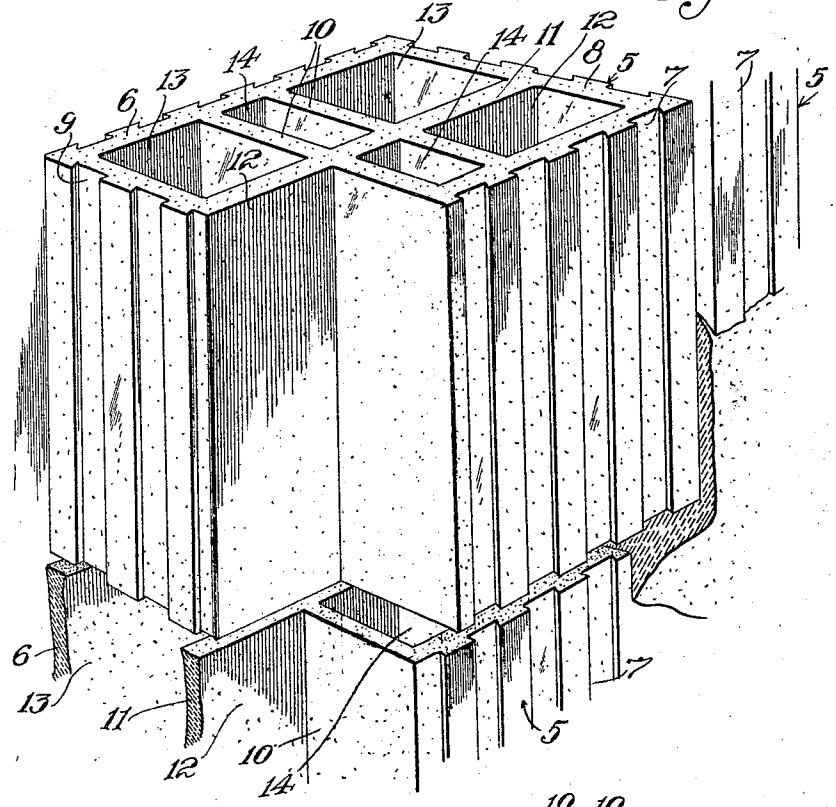
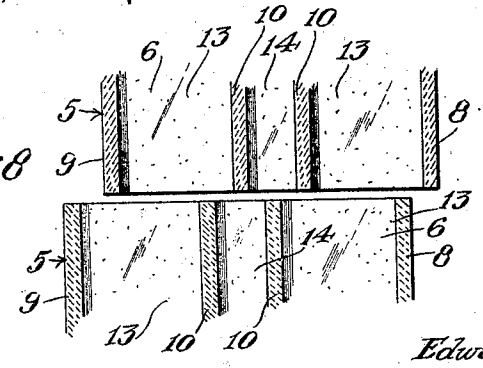


Fig. 8



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Patented Jan. 22, 1924. 1,481,249

UNITED STATES PATENT OFFICE.

EDWIN J. BEINECKE, OF NEW YORK, N. Y.

HOLLOW BUILDING TILE.

Application filed February 23, 1922. Serial No. 538,480.

To all whom it may concern:

Be it known that I, EDWIN J. BEINECKE, a citizen of the United States, and a resident of New York city, in the county and State of New York, have invented a certain new and useful Improvement in Hollow Building Tiles, of which the following is a specification.

This invention relates to building tile and more particularly, to hollow tile, such as are used in the construction of building walls for rendering such walls substantially fire and moisture-proof.

It is one of the important objects of my present improvement to provide a hollow building tile particularly designed for use in load bearing walls and which is of such form and construction that a maximum of rigidity and stability in the wall structure to vertical load stresses will be obtained.

The invention more particularly comprehends a wall tile of such construction as to afford an adequate support for the header course of facing brick and to enable the facing brick to be properly bonded with the hollow tile forming the interior portion of the wall and at the same time, break up the mortar course between the tile and the header brick so as to obviate to the greatest practicable extent, the seepage of moisture by capillary attraction through the mortar course to the interior face of the wall.

A further object of this invention is to provide a building wall made up of superposed cellular tile or blocks which provide vertical passages in the inner portion of the wall of maximum area with the webs separating adjacent passages from each other disposed in staggered relation to afford baffles so that the air is circulated upwardly in a circuitous course and the absorption or evaporation of the moisture finding its way through the mortar courses of the wall, thereby greatly facilitated.

My invention also has for another important object to provide a hollow building tile which is so treated before it is baked in the kiln that parts of the tile are connected to each other along definite lines of cleavage so that such parts can be readily broken off or separated from the body of the tile in order to enable the tile to be used in various instances where it would not be possible to apply a complete tile or block, such as around conduits, pillars, or as furring on the inner face of the wall. Thus it is possible to produce the tile in one or two standard forms and sizes and the necessity of providing tiles of a multiplicity of different shapes and constructions in order to meet conditions which may arise in the erection of a building, is obviated.

With the above and other objects in view, the invention consists in the improved building tile and in the several novel characteristic features thereof, as will be hereinafter more fully described, illustrated in the accompanying drawings and subsequently incorporated in the subjoined claims.

In the drawings wherein I have illustrated several desirable embodiments of the invention and in which similar reference characters designate corresponding parts throughout the several views,

Figure 1 is a perspective view showing one form of the improved tile illustrating the relative arrangement of superposed tile in the erection of a wall;

Fig. 2 is a plan view, the off-set or staggered relation of the webs of the vertically adjacent tile or block being shown in dotted lines;

Fig. 3 is a vertical sectional view through a portion of a building wall showing the improved tile bonded with the facing brick of the wall;

Fig. 4 is a perspective view of one of the tiles shown in Fig. 3;

Fig. 5 is a perspective view illustrating the tile shown in Fig. 1 of the drawings after the same has been cut so as to provide only one series of air cells or passages, the removed section of the tile being shown in dotted lines;

Fig. 6 is a detail perspective view showing the manner in which the dotted sections of tile, seen in Fig. 5, may be used as furring in connection with a brick wall;

Fig. 7 is a perspective view showing one corner broken or cut from the tile so that the tile may be fitted around pipes or conduits;

Fig. 8 is a fragmentary sectional view through adjacent superposed tile showing one arrangement thereof with the webs in staggered relation;

Fig. 9 is a similar view illustrating another arrangement of the tile;

Fig. 10 is a detail perspective view illustrating the manner in which the moist tile is cut before baking; and

Figs. 11 and 12 are detail perspective

views showing different ways of cutting the tile and illustrating several modified forms of the tile.

As is well known, hollow tile such as are used in building construction, are formed from clay or other suitable materials, the material being forced through a die press and cut up into sections of predetermined lengths. Each tile is provided with one or more continuous passages extending longitudinally therethrough for conducting heat and moisture so that it cannot find its way to the interior surface of the wall. The tile are faced with brick or other material at the outer side of the wall in the usual manner, and in the use of such tile as heretofore constructed in connection with the course of header brick or other bonding member, the area of the passages through the tile upon which the inner end of the header brick were superposed, was quite limited. Also, the mortar course between the header brick and the adjacent hollow tile afforded a convenient avenue through which moisture was drawn from the outer face of the wall by capillary attraction to the inner face thereof. Another serious disadvantage of hollow tile such as have heretofore been used in connection with the header brick has been that the brick would tend to rock or fulcrum on the outer web of the tile under vertical load stresses and would be loosened from its original position in the wall by the gradual breaking up of the mortar. I propose to overcome these deficiencies by providing a building tile having a multiplicity of continuous longitudinally extending chambers or passages of maximum area and the walls or webs of which are so relatively positioned and arranged that the inner end of the header brick will bear upon two spaced webs of the tile. Also, the new construction is such that there is a continuous circulation of air through the aligned passages of the wall tile in contact with the mortar joints so that all moisture which may find its way by capillary attraction through the outer portion of the wall will be absorbed and evaporated in such passages.

To the above end I have illustrated one embodiment of the improved tile in Fig. 1 of the drawings wherein the tile 5 as it comes from the die press is of general rectangular shape and may be of any suitable standard dimensions as required by the building laws. The outer body webs 6 and 7 constituting the parallel side portions of the tile are connected to each other at their vertical edges by the body webs 8 and 9. In this particular instance I have shown the body webs 6 and 7 integrally connected with each other by the transverse longitudinally extending webs 10 which are also suitably spaced from the body webs 8 and 9. These webs 10 in turn are integrally connected with each other and with the webs 8 and 9 by means of the web 11 which is coextensive in length with the other webs, and is preferably located at one side of the central median longitudinal plane of the tile and nearer to the body web 7 than to the web 6. When the tile is positioned in a wall structure, the body web 7 thereof faces toward the outer side of the wall.

The structure above described provides continuous outer longitudinally extending cells or passages 12 and inner cells or passages 13 at opposite sides of the center of the tile together with the intermediate relatively narrow air passages or cells 14. Upon reference to Fig. 2 it will be observed that the transverse dimensions of the passages 12 and 14 in the outer portion of the block or tile is appreciably less than the transverse dimensions of the inner passages or cells 13 and 14 owing to the location of the web 11, as above explained.

In the use of a tile of the above description in the erection of a building wall, the vertical mortar joints are broken by setting each horizontal course of tile in laterally off-set relation to the tile course previously laid. Thus, as indicated in Figs. 2 and 8 of the drawings, the vertically extending webs of the adjacent superposed tile are out of alignment or in staggered relation with respect to each other. The inner longitudinal air cells or passages are in free and open communication so that a maximum circulation of the air is permitted. As the air ascends through these passages, it carries in suspension the moisture which may find its way through the outer portion of the wall into the inner passages 13 and 14 of the tile. The webs 10 act as baffles, causing the air to take a circuitous course, the moisture being deposited upon the surfaces of the baffle webs, thereby greatly expediting its complete absorption or evaporation and practically precluding the seepage of moisture entirely through the mortar courses to the inner face of the wall.

The tile as it comes from the die press is in a moist and plastic condition. A wire or a thin steel strip, such as is indicated at 15 in the drawings, is now drawn for a short distance longitudinally of the tile at one of its ends and then transversely thereof along the line indicated at A (see Fig. 10), thereby cutting through the webs 10 and 11 and the body webs 7, 8 and 9. This end section of the tile is not, however, removed but is pressed firmly in place so that it closely adheres along the contacting edges of the several webs with the body of the tile and the end section of the tile can thus easily be cut off whenever required along the lines of cleavage thus created. The tile is then

placed in the kiln to be baked and allowed to remain therein for the requisite length of time. In this condition, the tile may be shipped to the builder.

When the tile are to be used with a facing of brick, the mason may readily split out the upper outer corner section of the tile along the line A—A, as indicated in Fig. 10 of the drawings, so as to provide a step or seat 16 at the upper end of the tile next adjacent to the facing brick. The wall facing is of the usual type and includes courses of "stretcher" brick and header or binder brick 17 which, as shown herein, are arranged in every sixth course in the wall. These latter bricks are arranged with their longer dimensions extending transversely of the wall so that the inner end portions of said bricks overlap the upper end of the outer body web 7 and the partition or division web 11. The inner end faces of the header brick are spaced from the front vertical edges of the upwardly projecting portions of the webs 8, 9 and 10 of the tile so that the mortar courses indicated at 18 extending between the upper and lower faces of the bonding or header brick and the adjacent tile are interrupted. I also preferably provide the webs 8 and 9 at their upper and lower edges with the notches or recesses 18′ so as to interrupt the mortar course extending between the cellular tile which are arranged between the spaced courses of header or bonding brick. By thus interrupting the mortar courses, any moisture finding its way by capillary attraction through the outer portion of the wall structure will be caught up and carried in suspension by the air circulating through the passages or cells of the tile when such moisture reaches a break or cut in the mortar courses.

It will be observed that the header brick at their inner ends extend over and upon the web 11 as well as upon the upper edge of the web 7 of the tile. By thus providing the two spaced points of support for the header brick upon the inner tile, said header brick will have no pivoting or rocking movement under vertical stresses transmitted thereto through the tile and consequently, the header brick will be absolutely held in a fixed and positive position with relation to the tile and wearing away of the tile webs by frictional rubbing contact with a consequent loosening of the header brick in the wall structure is obviated.

My improved tile above described eliminates the necessity of using furring on the inner side of the building wall. As is well known, in the construction of brick walls in cases where the side of a building is subjected to driving rain storms, the inner side of the wall must be faced with furring tile before the plastering is applied. In cases where the ordinary brick building wall is used, I may readily provide such furring tile as indicated at 19, in Fig. 6 of the drawings, each tile consisting of a segment or section of one of the tiles shown in Fig. 1 of the drawings. In order to enable the tile to be readily split to provide such furring, the wire or other tool 15 is arranged as shown in Fig. 11 at one side of the web 11 while the clay is yet moist and drawn the entire length of the tile, thereby providing a relatively narrow furring section having the body webs 7, side webs 8 and 9 and the intermediate webs 10. Such a furring section I have indicated in dotted lines in Fig. 5 of the drawings. The remaining section of the tile provides a single series of longitudinally extending cells or passages and may be used in various instances where the complete tile could not be employed. In the use of such furring tile, the open side thereof is opposed to the inner face of the building wall, the edges of the webs 8, 9 and 10 being in direct contact with the face of said wall and out of line with the vertical mortar courses. The plastering indicated at 20 is arranged upon the faces of the webs 6 of the furring tile. It will be understood that the exterior surfaces of the body webs of the tile are longitudinally ribbed or corrugated in the usual manner so as to provide an interlocking or holding means for the mortar or plaster. By the use of the furring tile, any moisture which may possibly find its way through the mortar courses of the wall proper in a driving storm, will be intercepted by the air spaces provided by the aligned channels of the furring tile and cannot pass through such tile to the plastering 20.

In Fig. 10 of the drawings I have indicated another way in which the tile might be split so as to enable electric wire or conduits to be fitted into one of the passages of the tile or to permit the proper fitting of the tile between or around columns or in relation to piping which may extend through the building walls. In such case, as shown by the wire 15′, a corner section of the tile including the webs 7 and 9, may be cut out for the entire length of the tile, thus providing access to one of the passages 12. On the other hand, the wire may be arranged as shown at 15^a so as to cut out a smaller corner section of the tile.

In Fig. 11 I have illustrated a tile similar to that shown in Fig. 10 except that in lieu of the two narrow intermediate passages 14, I provide a single narrow passage 25 located between the passages 12 and 13. In Fig. 12 I have shown a tile provided with spaced side passages 23 of the same dimensions and relatively narrow central passages 24 located between the side passages 23. In these instances last referred to, by reason of the

provision of a greater number of connecting webs, a certain amount of additional strength in the tile structure will be obtained. However, in each case it will be noted that the tile can be used in the manner explained and at the same time, will afford a maximum unobstructed air space in each tile for the free circulation of air. I thus obtain a wall structure by means of the use of the improved tile, which will be substantially proof against the seepage of moisture therethrough and will of course, likewise be a non-conductor of hot and cold air currents in addition to its well-known fireproof characteristics.

It is obvious from the above description that I can use my new tile not only in a vertical arrangement, as described above, but that I can apply it also in a horizontal arrangement which requires only such slight changes as will occur immediately to any man skilled in the building art. It will further be obvious to one skilled in the art that my present invention lends itself to still further modifications in form, proportion and shape without sacrificing any of the essential features thereof, namely, the provision of a building tile of this character having a maximum of structural strength and which provides means whereby the bonding members of the wall facing are adequately supported and bonded to the tile so that the structure will offer maximum resistance to load stresses, and said tile also providing continuous unobstructed air passages in the inner portion of the wall whereby any moisture finding its way through the mortar courses will be completely absorbed.

It will, therefore, be understood that while I have herein shown and described several desirable embodiments of the invention, the device is nevertheless susceptible of exemplification in numerous alternative forms and I accordingly reserve the privilege of resorting to all such legitimate changes as may be fairly embodied within the spirit and scope of the invention as claimed.

I claim:

1. A wall structure, comprising superimposed courses of cellular tiles having front, back, and side outer walls, inner walls extending from front to back, and from side to side, forming front and back passages in said tiles, the front passages being of less area than the back passages, the opposite ends of the tile of one course lying in substantially parallel planes, the upper ends of the tile of an adjacent course having a front reduced portion, the front and back outer walls of the several courses of tile being arranged in alignment with each other, the inner front and back connecting walls of one course of tile being arranged in staggered relation to the corresponding walls of a vertically adjacent course, and a facing composed of courses of stringer bricks and an intermediate course of header bricks, the inner ends of the header bricks overlapping the reduced portion of the upper end of one course of tile and being bonded therewith on the upper end of the front wall of said tile and on an inner side connecting wall parallel therewith.

2. A wall structure, comprising supplemental courses of cellular tiles having front, back, and side outer walls, inner walls extending from front to back, and from side to side, forming front and back passages in said tiles, the front passages being of less area than the back passages, the upper ends of the tile of one course having a front reduced portion, the front and outer walls of the several courses of tiles being arranged in alignment with each other, the inner front and back connecting walls of one course of tile being arranged in staggered relation to the corresponding walls of a vertically adjacent course, and a facing composed of courses of stringer bricks, and an intermediate course of header bricks, the inner ends of the header bricks overlapping the reduced portion of the upper end of one course of tile, and being bonded therewith on the outer end of the front wall of said tile, and on an inner side connecting wall parallel therewith.

In testimony that I claim the foregoing as my invention, and I have signed my name hereunder.

EDWIN J. BEINECKE.