

Sept. 3, 1935.

M. W. THOMPSON

2,013,367

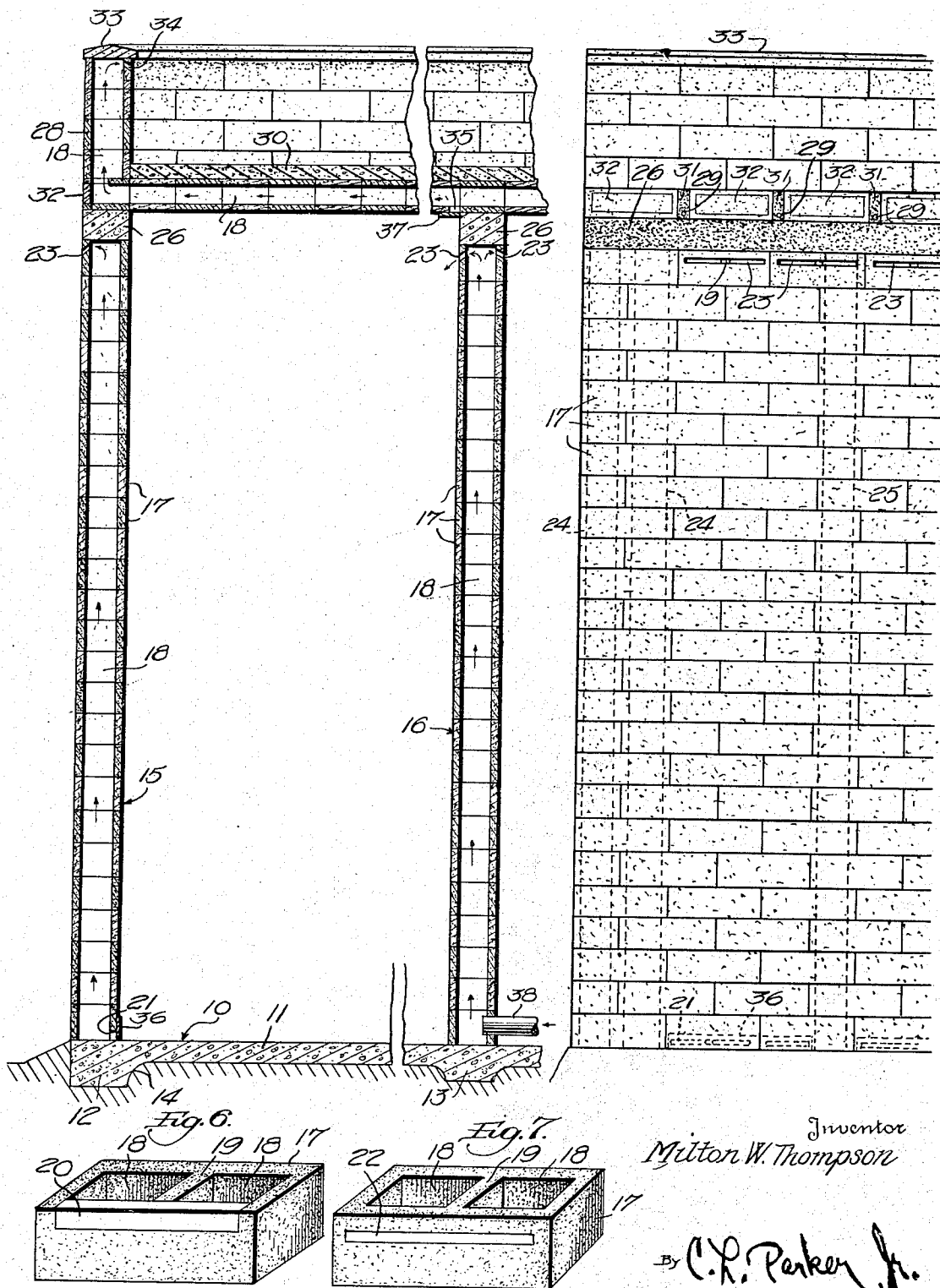
BUILDING CONSTRUCTION

Filed April 29, 1933

2 Sheets-Sheet 1

Fig. 1.

Fig. 2.



Inventor
Milton W. Thompson

By *C. R. Parker Jr.*
Attorney

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Fig. 3.

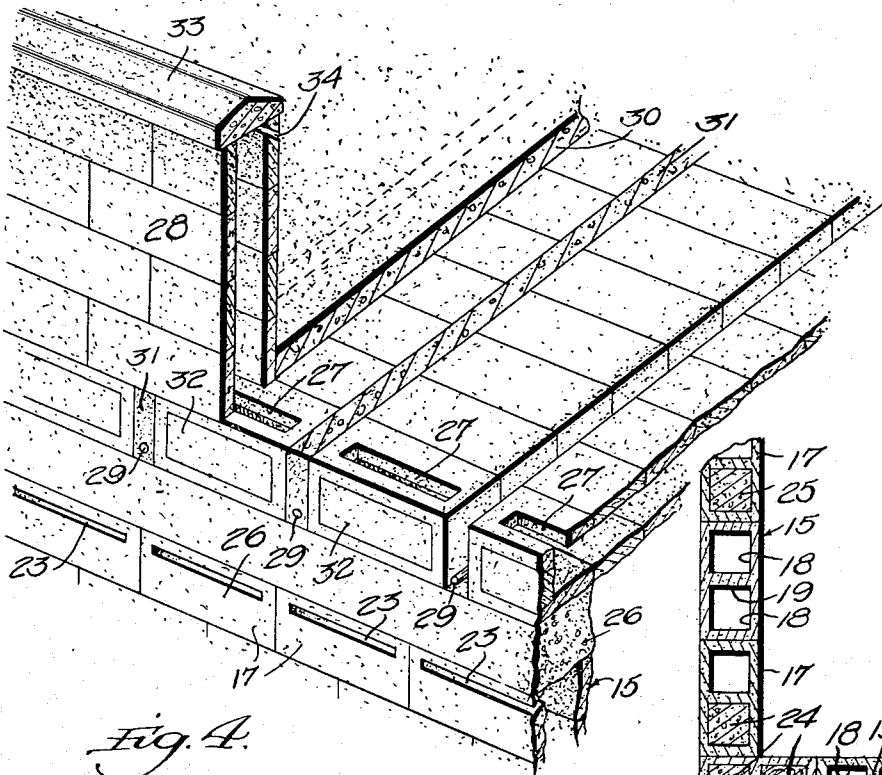


Fig. 5.

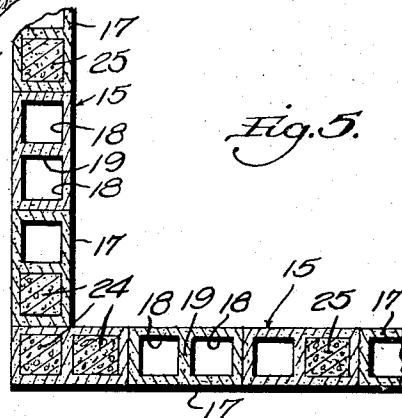
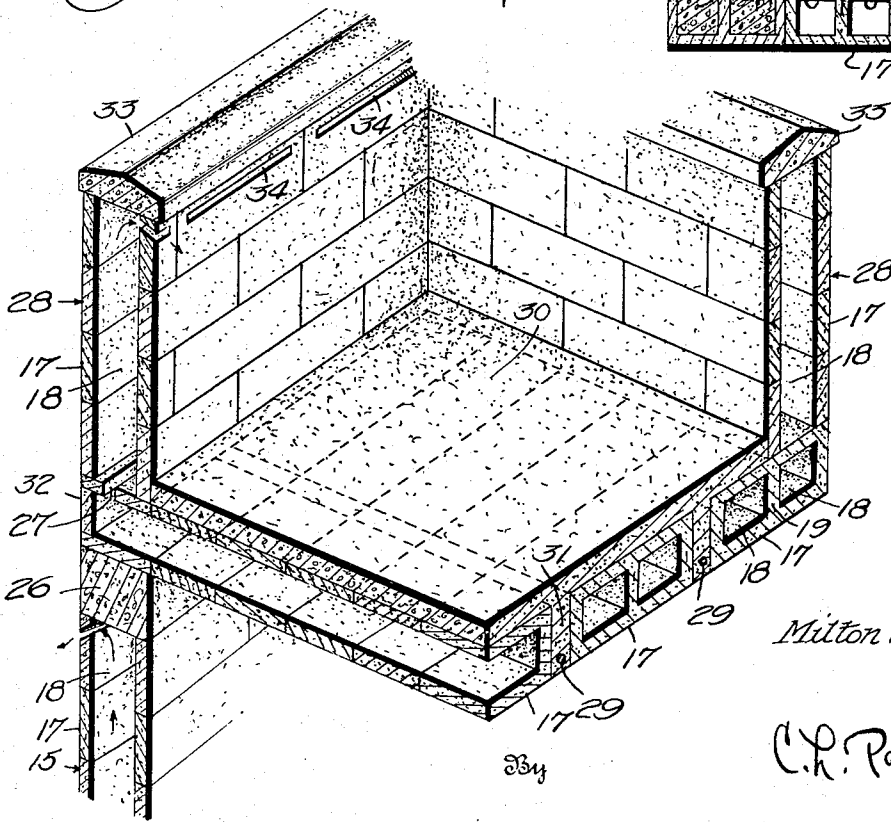


Fig. 4.



Inventor
Milton W. Thompson

C. H. Parker, Jr.
Attorney

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BUILDING CONSTRUCTION

Milton W. Thompson, Atlanta, Ga.

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1 Claim. (Cl. 72—30)

This invention relates to building constructions.

There has been a substantial trend in recent years toward the development of relatively low priced homes, and considerable research work has been done toward the end that both labor and material costs might be reduced. As is well known, the cost of material involved in the building of a home is relatively high regardless of the material used, and the final cost to the producer is greatly increased by the amount of skilled labor required in the erection of a home.

An important object of the present invention is to provide a building construction which is particularly adapted for the building of relatively low priced homes wherein there is a substantial saving effected in the cost of both labor and material.

A further object of the invention is to provide a building construction wherein the majority of the wall forming material is relatively cheap and need not be of the usual structural strength, but wherein no strength is sacrificed in the finished building.

A further object is to provide a building structure which is capable of erection with the use of a minimum amount of skilled labor, thus effecting a substantial saving in labor costs.

A further object is to provide a wall structure for buildings made up largely of filler blocks which may be assembled by unskilled labor without the use of mortar, and wherein the filler blocks are suitably tied together and the roof structure adequately supported by means of structural columns poured at spaced points within the filler blocks.

A further object is to provide a structure of the character referred to wherein adequate ventilation for the rooms of the building is provided through the walls thereof, and wherein the ventilating means operates to reduce radiation through the walls of the building to maintain the interior of the building in a relatively cool condition during warm weather.

A further object is to provide a structure of the character indicated wherein the ventilating means is capable of operation in connection with the roof of the building to cool the roof structure and further assist in maintaining the interior of the building in cool condition.

A further object is to provide a building structure having wall passages capable of use for ventilating the building in the manner referred to, and equally applicable in connection with air conditioning means for the building or for use with a hot air or other heating system.

A further object is to provide a wall structure

formed of a plurality of filler blocks having vertical openings therethrough arranged in vertical alinement throughout the height of the wall, and to pour concrete or similar columns in certain of the vertical openings to provide adequate supporting means for the roof structure, the remaining vertical openings of the wall structure being free for ventilation, air conditioning or heating.

In the drawings I have shown several embodiments of the invention. In this showing,

Figure 1 is a vertical sectional view through a portion of a one story building, parts being broken away,

Figure 2 is a side elevation of one corner portion of the building,

Figure 3 is an enlarged perspective view of an upper portion of the building looking from the outside thereof, parts being broken away, and parts being shown in section,

Figure 4 is a similar view looking from the inside of the building,

Figure 5 is a horizontal sectional view through one corner portion of the building wall,

Figure 6 is a detail perspective view of one of the filler blocks showing an insert therein adapted to be removed to provide a ventilating opening, and,

Figure 7 is a similar view showing an insert in the block adapted to be removed to form a ventilating outlet opening at the upper portion of the wall.

Referring to the drawings, the numeral 10 designates the base structure as a whole comprising a floor slab 11 and integral outside and inside footings 12 and 13. The base structure is poured as a unit from a suitable cement mixture, the ground being excavated as at 14 to receive the poured mixture. It will become apparent that the base structure may be the floor of the cellar or the first floor of the building, and in the present instance the base structure has been shown as forming the first floor of the building.

After the base structure has been laid out and completed, outside and inside walls 15 and 16 respectively are erected thereon. Each of these walls is formed of a plurality of preferably staggered blocks 17 each of which is shown in the present instance as being rectangular and formed with a pair of vertical openings 18 therethrough separated by a web 19. It is wholly unnecessary that mortar be employed in the placing of the blocks, and in the interest of economy it is preferred that the blocks be stacked in the manner referred to with the vertical openings of the successive blocks in registration throughout the

height of the wall. It will become apparent that the blocks 17 are filler blocks which need not in themselves possess the structural strength demanded of poured concrete walls or walls formed of the usual cement blocks. This being the case, further economy in construction is effected by employing blocks 17 formed of a lean cement mixture, while it is entirely practicable to form the blocks of even cheaper material, such as lime and sand preferably with a small amount of cement added. The present invention is of such a nature as to permit the manufacture of the blocks economically from relatively cheap cementitious mixtures, but it will become apparent that the invention is not limited in any way to the particular materials from which the blocks are formed.

The lowermost row of blocks of one wall or all of the walls are formed in the manner illustrated in Figure 6. All of the blocks may be made in any suitable machine, preferably one which is capable of making the blocks on the building site, such as the machine illustrated in Patent No. 1,072,253. Most of the blocks forming the walls are made in the manner indicated, but the particular block illustrated in Figure 5 is formed with a core block 20 placed in the mold and adapted to be removed from the block after it is formed. Such a block forms the lower row of blocks either for one wall or for all of the walls in the building, and the space left by the removal of the wooden core block 20 leaves an opening 21 at the lower edge of the block as illustrated in Figure 1. Such opening provides a ventilating opening communicating between the bottom of any room or rooms of the house and the registering openings 18 of the successive rows of blocks 17, except that certain of the vertical wall openings are utilized for another purpose to be described.

The uppermost row of blocks for any wall or walls of the building at the top of the first floor thereof are formed as indicated in Figure 7. Such blocks are formed with a core strip 22 placed in the mold to form an opening 23, and these openings communicate between the atmosphere and the vertical wall openings as indicated at the left side of Figure 1. Similarly constructed blocks may be employed for the interior walls for a purpose to be described, as illustrated at the right side of Figure 1.

Upon the completion of the first floor wall up to and including the blocks 17 which have the openings 23 therein, certain of the vertical wall openings are filled with a cement mixture, either with or without reinforcing means, as illustrated in Figures 2 and 5. The filling of certain of the openings thus provides supporting columns having the necessary structural strength to support the roof or the second floor of the building. It is not at all necessary that all of the wall openings be filled, and it is preferred that some be left open for ventilation and other purposes, as will become apparent. In practice it is preferred that the three wall openings adjacent each corner of the building be filled to provide adequate corner columns as shown in Figure 5 and illustrated by the numeral 24. Inwardly of the corners, certain other wall openings are similarly filled to provide supporting columns 25.

After the supporting columns 24 and 25 have been poured and have set, a roof beam 26 is poured along the tops of the interior and exterior walls as shown in Figures 1, 2, 3, and 4. These beams are of the usual type and may be

provided with suitable reinforcement if desired. The beams are poured by placing suitable simple forms against opposite faces of the walls, and after the beams have sufficiently hardened, the roof structure is placed in position.

A portion of the roof structure is formed of the blocks 17 placed in position as tiles somewhat after the manner of present building constructions. Suitable supporting boards are spaced at the proper height and are supported by vertical posts, whereupon the blocks 17 are arranged in parallel rows spaced from each other as indicated in Figures 3 and 4. The blocks 17 when used as roof tiles are placed in registering relationship instead of being staggered as in the formation of the walls, as will be apparent, and all of the tiles preferably are arranged with their openings 18 running in the same direction. The tiles at the ends of the rows are formed in a special manner for a purpose to be described. In forming such special tiles, a core strip similar to the strip 20 is employed except that it is spaced from the edge of the block whereby the resultant block or tile is provided with an opening 27, and accordingly an upward outlet is provided for each series of openings 18 in the rows of roof tiles.

After the roof tiles have been placed in position in the manner referred to, a parapet wall 28 is constructed around the building over the walls 15. Suitable reinforcing rods 29 are then arranged near the bottoms of the spaces between the rows of tiles, whereupon concrete is poured over the roof tiles and between the tiles to form a roof slab 30 and rafters 31. These rafters extend through opposite walls and terminate flush with the outer surfaces thereof as indicated in Figure 3. The adjacent faces of the blocks forming the roof tiles are closed as at 32 by a cementitious filler preferably placed in position merely by placing the blocks which have the openings 27 therein upon a flat surface with the openings 18 vertically arranged and pouring a cement mixture into these openings. Thus the outer wall of the building will be entirely flush except for the provision of the ventilating openings 23.

The parapet wall 28 is formed by stacking the blocks 17 in staggered relation as shown in Figures 3 and 4 with the vertical openings 18 in registration, thus forming passages communicating with the passages of the roof tiles through the openings 17. A cap 33 surrounds the top of the parapet wall, and the upper row of blocks 17 of the parapet wall are formed in the manner shown in Figure 7 to provide ventilating openings 34 preferably extending through the inner faces of the wall. The horizontal passages through the roof tiles preferably communicate with the interior of the room to provide means for the passage of air therethrough. For example, at points spaced from the outer walls 15, a row of the roof tiles parallel to the inner wall 16 may be formed in the manner indicated in Figure 6 to provide passages or openings 35 communicating between the interior of the building and the horizontal passages through the roof tiles.

The openings and passages which communicate between the interior of the building and the atmosphere may be suitably controlled according to weather conditions. For example, the openings 21 and 35 may be provided with cover plates or strips 36 and 37 respectively. These strips are removable to provide summer ventilation and may be placed in closed position to prevent air circulation in winter weather in the colder climates.

The closure strips need not extend throughout the length or width of a room but may be made in short sections covering two or more openings 21 or 35. For example, the strip 36 in Figure 2 has been illustrated as being of a suitable length for closing the lower ends of three of the vertical wall passages. The wall passages through the interior wall or walls 17 may be utilized for any desired purpose. Pipes 38 may extend into the vertical passages of the wall 16 and may communicate with an air conditioning apparatus from which conditioned air is pumped into the passages of the wall 17 and discharged from the upper end of the wall through the openings 23. This construction also may be utilized for heating the building by connecting the pipes 38 to a suitable heating system and reversing the movement of the air to draw air into the vertical spaces of the interior wall through the openings 23, the heated air being discharged directly into the interior of the building, as will be apparent.

Upon the completion of the main building structure in the manner referred to, the walls may be suitably surfaced and the top of the roof slab waterproofed. It is preferred in practice that the outer surfaces of the walls be stuccoed to suitably waterproof the joints between the blocks 17, since these blocks preferably are not mortared. Interior wall faces may be plastered and painted or papered as desired.

It will be apparent from the foregoing that the present invention provides a class of dwelling which is not available under ordinary building systems. The present system is particularly useful in providing one story structures with or without cellars, and such a structure has been illustrated in the drawings. In constructing the house, the plan is laid out on the site, whereupon the ground is excavated to provide for the floor slab 11 and footings 14. The cement mixture for the floor structure is mixed and poured, and in the meantime a simple relatively cheap block making machine such as the machine disclosed in Patent No. 1,072,253 may be utilized on the site for making the blocks 17. Such system eliminates the necessity for a block making factory and requires little investment in equipment, and many of the blocks may be made in the course of the day's work.

The blocks are preferably made of a lean cement mixture to provide economy in material costs, although it will be apparent that other mixtures such as lime and sand may be employed since the blocks 17 act purely as filler blocks and as forms for the supporting columns 24 and 25. Each block may be made in a short period of time merely by filling the mold, successively lifting and dropping each end of the mold to impact the material therein to form a harder block than can be secured by the mere pouring of the cement, and after the block is so formed, it is firm enough to be immediately removed from the mold. The blocks made each day are sufficiently hard to be placed in the walls of the building the following day.

Since the blocks are stacked rather than mortared, it will be apparent that cheap labor may be employed in most of the erecting work of the building. The aligned openings of the wall blocks provide forms into which the columns 24 and 25 are poured, and this work also may be accomplished with unskilled labor. Standard supporting boards and posts for supporting the roof tiles until the roof slab and rafters have been poured and hardened may be carried from job to

job, thus further reducing costs. The forms employed for pouring the beams 26 obviously will be of the simplest type not requiring the use of skilled labor.

The poured columns 24 and 25 provide the necessary structural strength for supporting the roof structure or the second story of the building and they also anchor the blocks in proper position. Such anchorage is increased by the provision of an adequate stucco covering on the external wall surface, and the resultant building meets all requirements as to structural strength while materially lowering the costs of both labor and material.

The use of the parapet wall is preferred since this type of structure lends itself particularly well to the present invention, although it will be apparent that any roof structure may be employed. In a building of the type illustrated, the roof slab is preferably formed with a pitch of approximately one inch in ten feet downwardly toward a line across the center of the building forming a shallow trough from which rain water readily may be drained through a suitable down spout.

Accordingly it will be apparent that the present invention provides a class of building structure particularly suited for dwellings and wherein the building may be of any desired type of architecture. The finished building accordingly can be made fully as attractive as buildings erected in accordance with conventional systems, while a dwelling of a given size may be completed far more cheaply thus opening a new field of home purchase to people who are unable to afford a house of the necessary size constructed in accordance with present methods. If desired, the floor slab may be provided with wood flooring, but in the interest of economy it is preferred that it be provided with a suitable attractive solid linoleum cemented thereto.

It will be apparent that the provision of ventilating, heating, air conditioning and other passages through the walls is not limited to an external wall of the building but may be used equally well with an interior wall or with the roof structure as disclosed. Where the term "wall structure" occurs in the claim without limitation, therefore, it is understood that this term is intended to include any structural unit of the building such as an exterior or interior wall, a parapet wall, or the roof structure. It similarly will be apparent that the horizontal passages of the roof structure are not limited in their application to such structure, but may be included in the floor structure of an upper story of the building. The term "superstructure" as employed in the claim, accordingly is intended to cover either a roof structure or the floor structure of an upper story of the building.

It is to be understood that the forms of the invention herewith shown and described are to be taken as preferred examples of the same and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claim.

I claim:

A vertical building wall structure formed of a plurality of superimposed directly contacting preformed blocks, the blocks of each row being staggered with relation to the blocks of the adjacent rows, each block being substantially rectangular in horizontal section and provided with a pair of enclosed openings therethrough, the blocks of alternate rows being arranged in verti-

cally alined series, and the openings through the blocks of the respective rows being alined to form a plurality of vertical passages, load carrying cementitious columns formed in certain of said vertical passages with their upper ends terminating substantially in the plane of the upper faces of the uppermost row of blocks, certain of said columns being spaced apart a distance great-

er than the width of certain of said vertical series of blocks whereby the blocks in the latter series are maintained in position solely by engagement with adjacent blocks, a beam extending over and supported by the upper ends of said columns, and a superstructure supported by said beam. 5

MILTON W. THOMPSON.