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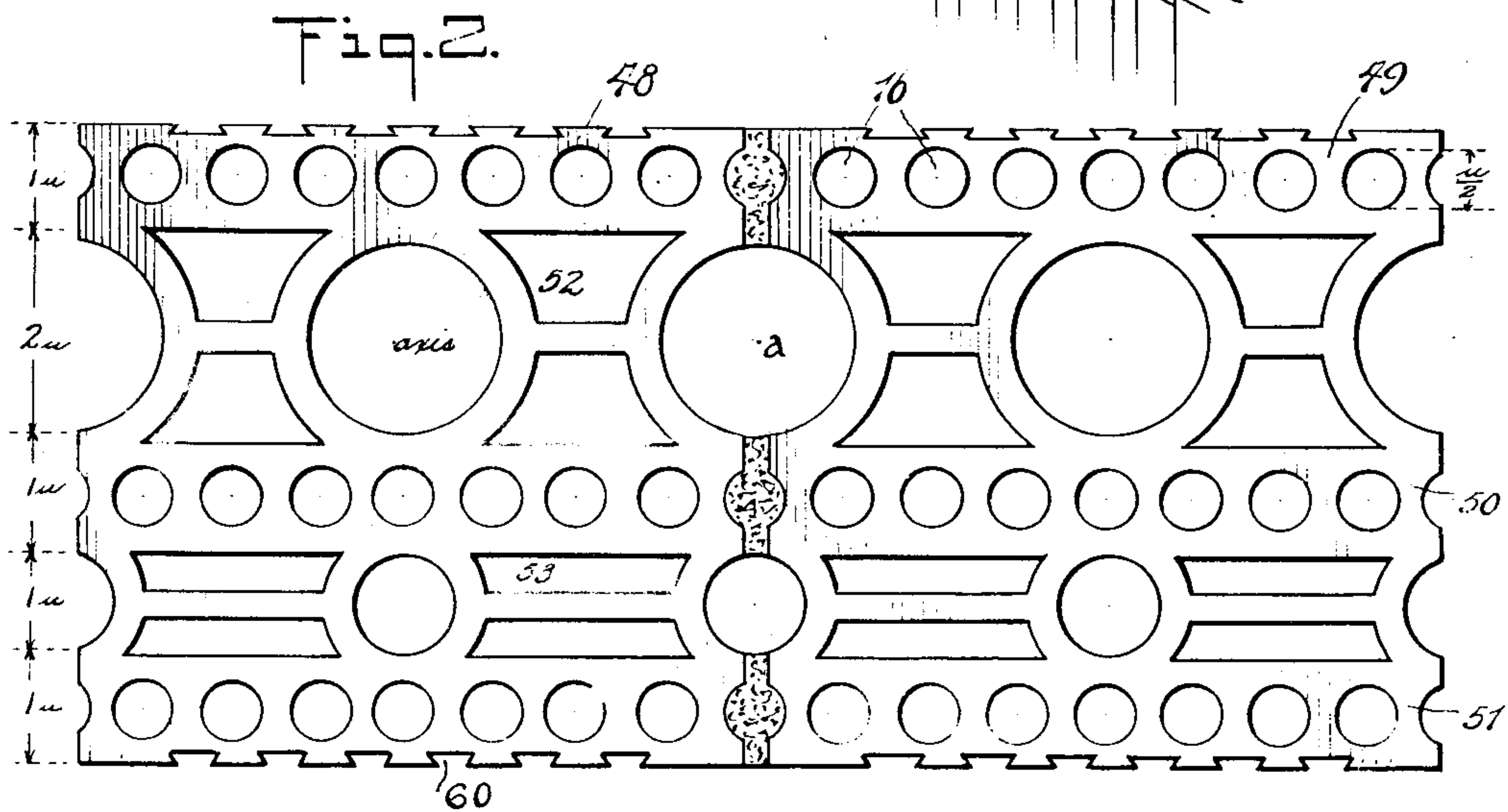
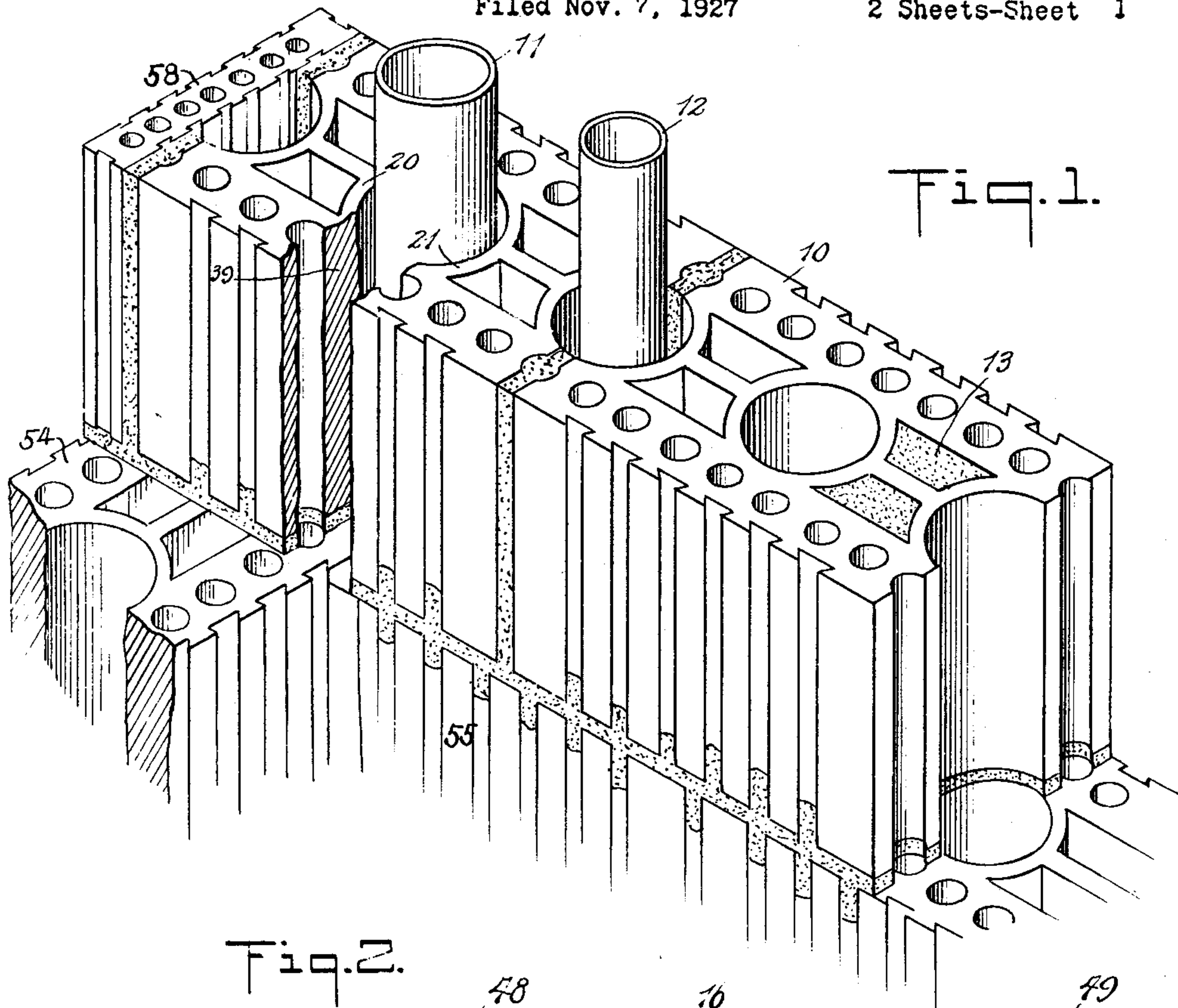
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HOLLOW CLAY TILE BUILDING BLOCK

Filed Nov. 7, 1927

2 Sheets-Sheet 1



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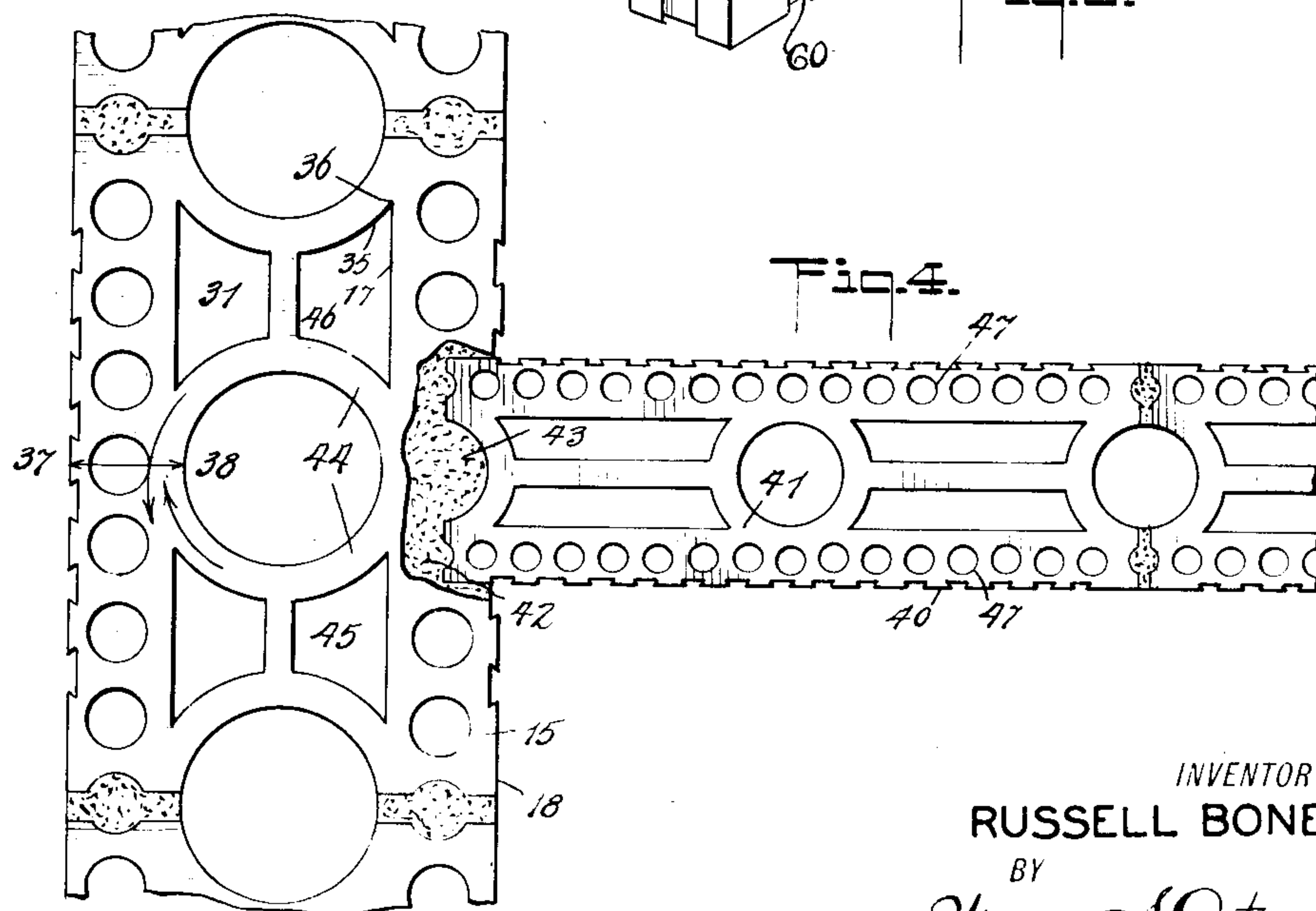
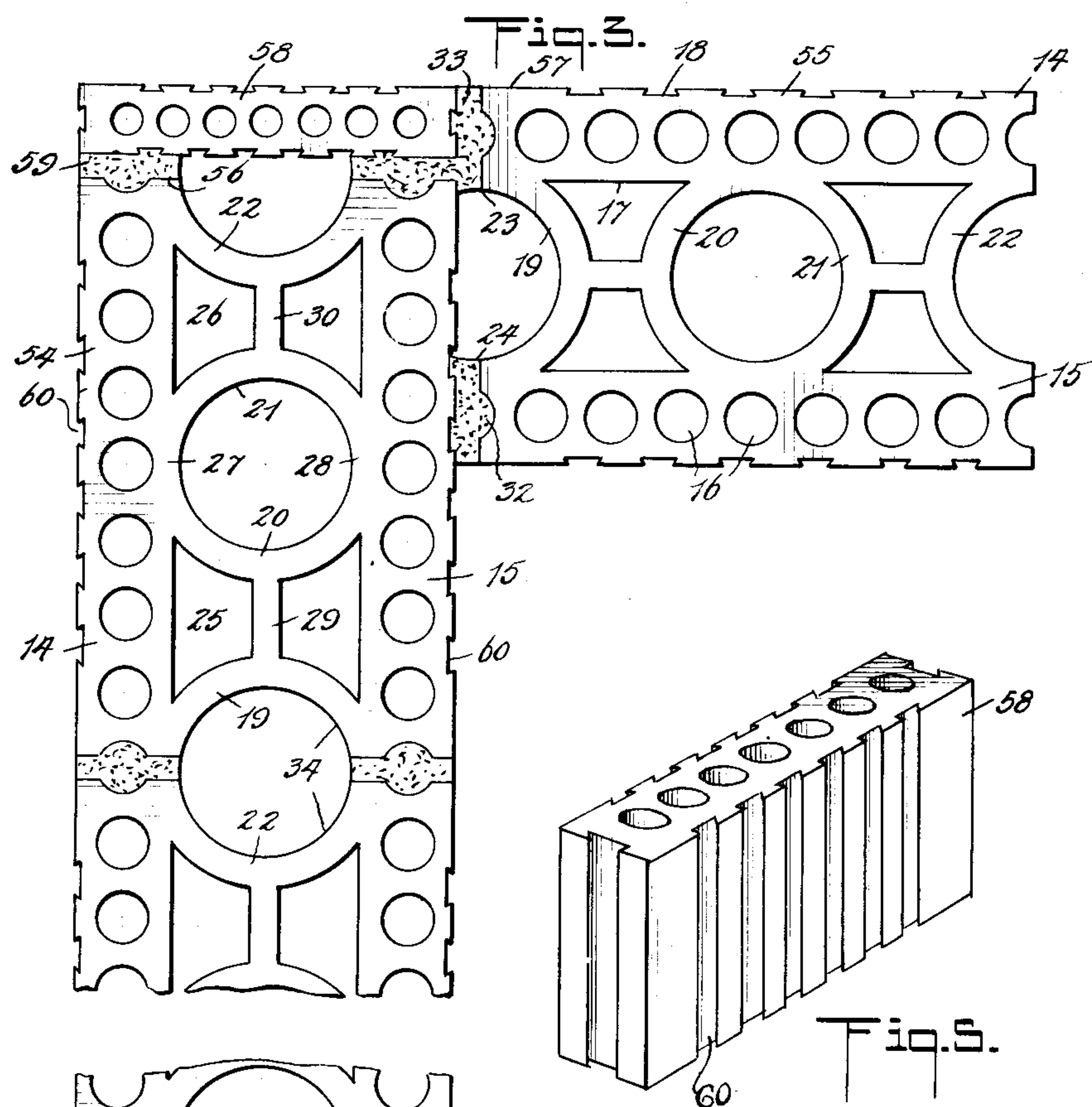
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HOLLOW CLAY TILE BUILDING BLOCK

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

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HOLLOW CLAY TILE BUILDING BLOCK.

Application filed November 7, 1927. Serial No. 231,762.

The invention relates in general to a hollow block building wall construction and specifically relates to a form of hollow building block used in forming the wall construction.

5 The primary object of the invention in so far as the wall aspect of the disclosure is concerned is to provide for the easy construction of walls of standardized width; which will economize in the labor cost of building walls
10 and which will be formed of an amount of material less than the amount of material heretofore regarded as necessary in a hollow tile wall of corresponding width and at the same time to provide equal if not improved
15 structural strength over walls formed of similar forms of hollow blocks.

This object of the invention is attained broadly by forming the wall in tiers of hollow blocks of easily portable weight, cored
20 to permit an arrangement of the blocks in vertically offset relation to bring certain desired cells accurately in vertical alignment.

The primary object of the invention in so far as the hollow building blocks themselves
25 are concerned is to provide a block which will be lighter in weight than similar sized blocks of known construction, and which at the same time will have greater strength, particularly in its resistance to crushing effects, than is
30 possible with known constructions should such constructions be made with the amount of material employed in the block structure herein disclosed. This object of the invention is attained by apportioning the selected
35 mass of block forming material to the different parts of the block and the arranging of the material so apportioned in a manner to attain the requisite strength in the several parts with the least amount of material necessary for the functioning of that part.
40

The invention features the utilization of a form of building block generally known as a double wall block characterized by two parallel load sustaining walls connected by some
45 form of transverse webs. In such a block the present disclosure features a distribution of material so that in a unit width of block the material is apportioned between the outer walls and the connecting webs in such manner that the maximum strength of outer wall is provided and the connecting web reduced in width and therefore in mass over conventional structures but with the webs so disposed as to mutually brace each other and,
50 particularly, when assembled into the fabri-

cated wall, to provide the requisite bracing of the block walls relative to each other.

This phase of the invention is attained by forming a cellular construction between the inner and outer block walls integrally connecting the same in which laterally directed strains imposed on the outer face of either block wall and in any direction which ordinarily would cause any tendency towards a movement of the walls towards each other
60 will be resolved into components extending lengthwise of the relatively massive block walls in distinction from conventional structures where any such strains are directed on the walls perpendicularly thereto and therefore in their direction of least dimension.
65 70

Still another object of the invention and featuring economy in manufacturing cost as well as the perfecting of the block is to provide a hollow block of the type outlined which
75 will tend to dry informally in all parts during its manufacture and thus tend to minimize losses due to unequal drying and resulting development of lines of weakness and other structural defects.
80

Still another object of the invention is to provide a form of building block and walls therefrom which can be easily broken away in situs or preformed at the time of its manufacture to provide joints with partitions,
85 floor supports and the like, and at the same time maintain the internal cellular construction intact and disposed as an internal reinforcement to strengthen the portion of the block weakened by the breaking away or
90 omission of part of its outer face to form the requisite joint.

Various other objects and advantages of the invention will be in part obvious from an inspection of the accompanying drawings and
95 in part will be more fully set forth in the following particular description of one form of mechanism embodying my invention, and the invention also consists in certain new and novel features of construction and combination of parts hereinafter set forth and claimed.
100

In the accompanying drawings:

Fig. 1 is a perspective view of a portion of two walls forming a corner constituting a preferred embodiment of the wall feature of the invention, and also showing a preferred form of the block constituting one of the unit of said walls;

Fig. 2 is a plan view looking down upon a

part of a wall structure formed from blocks constituting a modification of the form shown in Fig. 1, and showing a duplex form of block which may be assumed to be a foundation wall on which one of the walls of Fig. 1 is positioned;

Fig. 3 is a plan view of a complete corner partially shown in Fig. 1 formed for the major part of the type of blocks shown in Fig. 1 and showing a facing tile or slab coacting to complete the corner;

Fig. 4 is a plan view of part of a wall showing the jointure between the wall herein featured and an interior partition; and

Fig. 5 is a perspective view of the corner slab or tile shown in plan in Fig. 3;

Considering the wall as a whole it is made up of superposed tiers of rectangular building blocks 10 somewhat following conventional practices in forming walls of hollow blocks. The blocks are disposed end to end in position staggered horizontally relative to the blocks in the adjacent tiers so that the joints formed by the continuous ends of adjacent blocks are disposed in vertical alignment with centrally positioned cells in the blocks of the tiers next above and below the end joints. This vertical alignment of cells in the finished wall construction is for the purpose of accommodating stand pipes 11, conduit pipes 12 and block interlocking columns 13 conventionally formed by pouring cementitious material into the vertically aligned cells during the progress of completing the wall.

Referring to one of the standardized blocks it is noted that it is formed primarily of three parts, an outer wall 14, an inner wall 15 preferably of equal width, disposed parallel to each other and each wall preferably containing a line of elongated cells 16, which in the instant case extending vertically. These cells are of cylindrical form and as illustrated have a diameter substantially equal to one half of the thickness of the containing wall. The line of cells is centered in each wall and spaced substantially equidistant from the inner side or face 17 and the outer side or face 18. It is the intent of this construction to provide extreme rigidity and massiveness in these outer walls and thus attain maximum resulting resistance to crushing strain directed thereon in all directions. For the purpose of economy in use of material where the material would not contribute effectively to strengthen the construction the wall is provided with the cores 16 as herein disclosed. It has been found that after a certain minimum width has been exceeded the providing of the wall with these cylindrical cores has but little effect on the strength of the wall and there is attained a saving of material and an incidental lightening of the weight of the block as a whole.

One particular feature of novelty in this disclosure is the providing of four longi-

tudinally spaced apart, relatively thin, transversely extending curved webs 19—20 21—22 which coact to form a mutually braced cellular construction integrally connecting the walls 14 and 15. These webs are each substantially semi-circle in plan with their ends merging into the walls and with their diameters extending transversely of the blocks, as indicated at 23—24, Fig. 3. The cellular construction taken as a whole may be regarded as having the form of two H's, 25—26 disposed side by side. The two end webs 19 and 22 form respectively the concaved ends of the cellular construction at opposite ends of the block and between and within the planes defining the adjacent ends of the walls 14 and 15. The two central semi-circular webs 20 and 21 coact to provide a preformed central circular web, the diametrically opposite sides 27 and 28 of which merge respectively into the walls 14 and 15 adjacent their midlength. Each of the curved legs 19 and 20 of one of the H constructions and 21 and 22 in the other case are connected by thin longitudinally extending webs 29 and 30 which form the crotch portion of their respective H forms and are positioned in the longitudinal medial plane of the block. This construction also provides on opposite sides of the webs 29 and 30 and between the same and the inner faces 17 quadrilateral cores 31.

The ends of the walls 14 and 15 are provided with mortar receiving recesses 32 corresponding in dimension and location to one half of one of the cells 16 and adapted to receive the conventional mortar joints 33 usually disposed between adjacent blocks. The blocks are so proportioned and the end webs 19—22 so designed that when the blocks are assembled with the mortar joints therebetween as shown in the several figures there is provided between adjacent blocks a fabricated circular web 34 which will have the same dimension as the preformed circular web formed of the interior webs 20 and 21 so that in forming the wall the cell provided by the fabricated circular wall 34 will constitute a continuation of the preformed cell, formed in the blocks immediately above and below each such fabricated circular web.

It is particularly noted that each of the webs 19—20, and 21—22 merge at their ends angularly into the outer walls 14 and 15 and that the convex side 35 of each web forms a sharp acute angle 36 with the inner face 17 of each wall. If the line defining the outer periphery of the central circular web was projected and continued it would overlap each of the walls 14 and 15. As the web thus merges directly into and in effect overlaps the walls there is provided a rugged connection of a relatively great mass of material, considered both lengthwise and transversely of the block, between the inner periphery of the circular web and the outer face of each

block. This construction distinguishes from a known form of block where connection is made between an internal cellular construction and the side wall through the agency of frail connecting webs which are very apt to break. Such forms of webs provide an extremely weak connection with the massive outer walls particularly due to unequal shrinking during the drying process in forming the blocks. In the instant case the parts of the wall which join with the webs forming the cellular construction are of maximum width as shown along the line 37—38 (Fig. 4) thus providing a massive connection between the cellular structure and the side walls which will be of maximum strength.

As the webs 20 and 21 each merge into the outer walls independently of each other, it is possible, as indicated at 29 in Fig. 1 to entirely break away the portion of one wall between the ends of the webs 20 and 21 without entirely destroying the internal bracing effect of the circular webs. Any such broken away portion will ordinarily be filled with conduit boxes and other inserts embedded in cementitious material so that the breaking away of one side of the block, even though it be completely broken away as shown in Fig. 1, the construction will not be materially weakened.

From this construction it will be appreciated that laterally directed strain imposed on the outside of either wall will be transmitted transversely of the block to the opposite wall and will be directed into the opposite wall longitudinally as suggested by the arrows in Fig. 4. In this way strains in the cellular structure will be directed into the massive side walls and in the direction of their maximum width or length and not transversely thereof in the direction of their smallest dimensions as has been known heretofore in similar wall structures.

A block of the type under discussion is particularly efficient in providing a joint for some other structural parts, such as the interior partition 40 shown in Fig. 4. In this instance the portion of the inner wall 15 between its three middle cells 16 and between these cells and the outer face 18 of the block has been broken out to receive the adjacent end of a partition forming block 41 intruded into the broken out recess 42 and secured in place by a mortar filler 43. It is noted that in this instance the preformed central circular web 44 is preserved circularly intact or substantially so and the portion of the block weakened by the recess 42 is backed by an internal reinforcement 44 which integrally connects the outer walls. Even if the broken out portion should not happen to come in line with the circular reinforcement but should be offset from the position shown in Fig. 4, it would still be true that any such weakened portion of the inner wall would

be backed by an internal and mutually braced web construction, such as the H-form of wall braces 45 and 46 shown at opposite ends of each block.

One of the important features of this invention relates to the peculiar disposition of the material considered in the plane of the block, that that is in the plane of the face through which the cells open. The material is so distributed that one third of the total mass is contained in each of the walls 14 and 15 and the remaining third is disposed in the cellular structure between the walls. The material is so disposed that the width of the cellular construction in the preferred form of block is twice the width of either wall. This peculiar disposition of material has been found to be most effective in providing a block having maximum strength to resist crushing effect. In the specific form of block shown in Figs. 1 and 3, each of the walls 14 and 15 is two inches wide, the cellular structure is four inches wide making a total width of eight inches and this block will be referred to hereinafter as an eight inch block. The partition shown in Fig. 4 has its outer walls 47 one inch wide, spaced apart a distance of two inches, and this block is known as a four inch tile block.

In the showing in Fig. 2 there is illustrated a portion of a wall formed of two foundation blocks 48 designed to constitute the footing of a superposed wall of the type shown in Figs. 1, 3 and 4. The block 48 is formed of three parallel transversely spaced apart walls 49, 50 and 51 with a cellular construction 52 between the walls 49 and 50 and a cellular construction 53 between the walls 50 and 51. Considering the part of the structure formed of the walls 48 and 50 together with the connecting cellular structure 52 it will be noted that this structure is identical with the eight inch blocks described in connection with Figs. 1 and 3. Considering the walls 50 and 51 of this foundation block together with the cellular structure 53 therebetween, it will be noted that this structure forms a block similar to the block described in connection with Figs. 1 and 2 except that the cellular structure has one half of the width of the cellular structure in the preceding figures, or differently expressed the cellular construction has the same width as the adjacent wall, that is two inches. Assuming therefore that the walls have a width corresponding to some unit length of measurement, then the four portions including the three walls 49, 50, 51, and the cellular structure 53 are of unit width while the cellular structure 52 is twice such unit width. As the cells 16 are one half of the width of the walls it would mean that these outside cells have a diameter of one-half of unit length as indicated at the right of Fig. 2. By means of a single size of foundation blocks, such as is illustrated in Fig. 2, it is possible to super-

pose thereon two different widths of wall, that is an eight inch wall overlapping the block walls 49 and 50 or a six inch wall overlapping the block walls 50 and 51. In either suggested form of superstructure the cells may be disposed in vertical alignment as hereinbefore suggested for the superposed part of the wall shown in Fig. 1.

Referring to the corner structure, particularly shown in Fig. 3, it is noted that the end block 54 in one wall partially laps the end block 55 in the adjacent wall with which it forms the corner. The exposed end 56 of the block 54 is spaced inwardly from the plane 57 defining the outer face of the other wall. This space is filled by a corner block, slab or tile 58 shown separately in Fig. 5. The parts are so arranged that the tile 58 together with the associated mortar joints 59 coact to form a square corner to this portion of the wall. This block is referred to herein as a smooth faced block as it functions to conceal the recessed or otherwise roughened end of the building block. It is within the scope of the disclosure however to groove or otherwise roughen the exposed sides of some or all of the blocks to permit a bonding with a suitable facing material and for this purpose the outer faces of the blocks are provided with grooves 60 dovetailed shape in transverse cross section.

Instead of positioning all of the tiles 58 in vertical superposed relation and parallel to the face 57 of the wall a better construction is provided by staggering the end blocks in succeeding tiers so that the block on top of the block 55 in Fig. 3 will overlap the block 54 and extend almost to the outer wall and with the tile corresponding to the tile 58 overlapping the end of the tile shown in Fig. 3 and disposed flush with the outer face of the block 54 as suggested at the left of Fig. 1.

It has been found in practice that the percentage of losses during the process of manufacturing the blocks herein disclosed has been reduced over the percentage of losses which has occurred in similar forms of hollow building blocks where there was not the proportioning of material to the outer walls of cellular constructions as is featured in the form of blocks shown in Fig. 1. It is believed that this economy is effected largely by a better and more uniform drying of the parts of the blocks than is possible with known forms. It is obvious that the drying of the outer relatively massive wall will be at a less rate than the drying of the relatively thin webs which form the internal cellular structure. On the other hand, the outer walls are more exposed than the internal web and this apparently has some compensating effect for the drying appears to be substantially uniform throughout the blocks. It is noted that in drying the circular web 34 which is the element most liable to crack contracts uniformly about an axis

of reference a and there is therefore eliminated the strains which are apt to be set up in thin webs which are not symmetrical with reference to some common neutral axis. With uniform drying the tendency of the thin webs to break away from the more massive outer wall has been minimized and the finally dried block does not indicate that it possesses any weakened lines or areas which are apt to rupture or crack.

Compared with conventional blocks of equivalent dimensions and approximately the same crushing resistance strength, the present block features lightness in weight due to the relatively less amount of material used. The block and therefore the wall therefrom features relatively massive outer walls disposed where maximum strength is desired in a wall and with the massive walls braced by internal webs which of themselves and considered individually are relatively weak but which in their accumulative and mutual bracing effects provide the requisite strength to the blocks considered transversely of the same.

A wall constructed as herein disclosed has pronounced fire protective features. Even though a fire is built against the outside face of the wall there is very little raise of temperature at the face of the opposite or inner wall and there is lacking the usual cracking or breaking of the connecting webs which occur under such tests. This insulating property is believed to be due, at least in part, to the fact that in the thin webs there are relatively large cooling areas compared to the mass of material in the same. There is a tendency for the cores in the walls to act as air insulators and the thin walled web act as radiators all of which tends to dissipate the heat before it reaches the inner wall. It is obviously within the scope of the disclosure to seal the cells at the top and bottom or between tiers and thus providing a highly insulated air celled wall.

I claim—

1. A hollow building block comprising a pair of spaced apart parallel walls, a plurality of curved webs each integrally connecting the walls, two of said webs coacting to provide a circular web having diametrical opposite sides merging into the walls, the convex side of each web forming an acute angle with the inner side of each adjacent wall, the inner periphery of said circular web at opposite sides being substantially tangent to the plane defining the inner side of the adjacent wall, and the portion of each wall between the apices of said angles provided with a plurality of cells with the portion between any two adjacent cells and between said two cells and the outer side of the wall adapted to be broken away or otherwise omitted to recess the block opposite the reinforcement provided by the circular web.

2. A hollow building block comprising an inner and an outer hollow wall disposed in parallel spaced apart relation and an intermediate cellular construction including thin curved webs of uniform thickness with their ends merging at an acute angle into and integrally connecting the exterior walls, said exterior walls having approximately the same width and said cellular construction having a width measured between the walls substantially equal to the sum of the widths of the two exterior walls, and the mass of material comprising said block being distributed approximately one third in each of said hollow exterior walls and the remaining third in said cellular construction.

3. A hollow building block comprising a pair of spaced apart parallel walls and curved webs integrally connecting the walls, one of said walls provided with a line of cells, the portion of the block between two of the cells and between said two cells and the outer side of said wall adapted to be broken out to form a joint with another building unit, and two of said webs rounding into and merging into each other to mutually brace each other and both of said webs merging at an angle into the inner side of said wall adjacent said two cells thereby to compensate for the weakening of the block adjacent the place where it is to be broken away.

4. In a hollow building block, the combination of a pair of outer load sustaining walls disposed in parallel relation, each wall having parallel faces and a line of cells, centered between the faces, each cell being cylindrical and having a diameter substantially equal to one-half of the thickness of its containing wall and a cellular construction integrally connecting the walls and adapted to transmit strains from one wall to the other, said construction including long, thin curved webs meeting the walls at an angle and disposed

to transmit transversely directed strains on one of the walls into the other wall in a direction parallel to one of its two greatest dimensions.

5. A hollow building block comprising a pair of walls disposed in spaced apart relation, and an intermediate cellular construction integrally connecting said walls, said construction including a circular web symmetrical with reference to its axis, merging directly and angularly into the walls and with its projected outer periphery overlapping the walls, whereby there is provided a rugged connection having relatively great length and breadth of material between the inner periphery of the circular web and the outer face of each wall.

6. A hollow building block comprising a pair of relatively wide load carrying walls disposed in spaced apart parallel relation and each wall provided with a line of cells, an intermediate cellular construction integrally connecting said walls, said construction including an H-shaped disposition of webs comprising two transversely extending relatively thin curved webs merging at opposite ends at acute angles into the wide load carrying walls and with their convex sides facing each other and a thin web connecting the crown portions of the curved webs, said thin web being in spaced relation to and disposed with its length extending parallel to the load carrying walls, each of the webs forming parts of circles with the inner periphery of their end portions disposed substantially tangent to the plane defining the inner side of the adjacent wall whereby said ends, if extended, would overlap in part the thick load carrying walls.

Signed at Milledgeville, in the county of Baldwin, and State of Georgia, this 3rd day of November A. D. 1927.

RUSSELL GLENN BONE.