Dec. 27, 1938. E. R. LOCKE 2,141,397

BUILDING SYSTEM

Filed Sept. 14, 1937 2 Sheets-Sheet 1

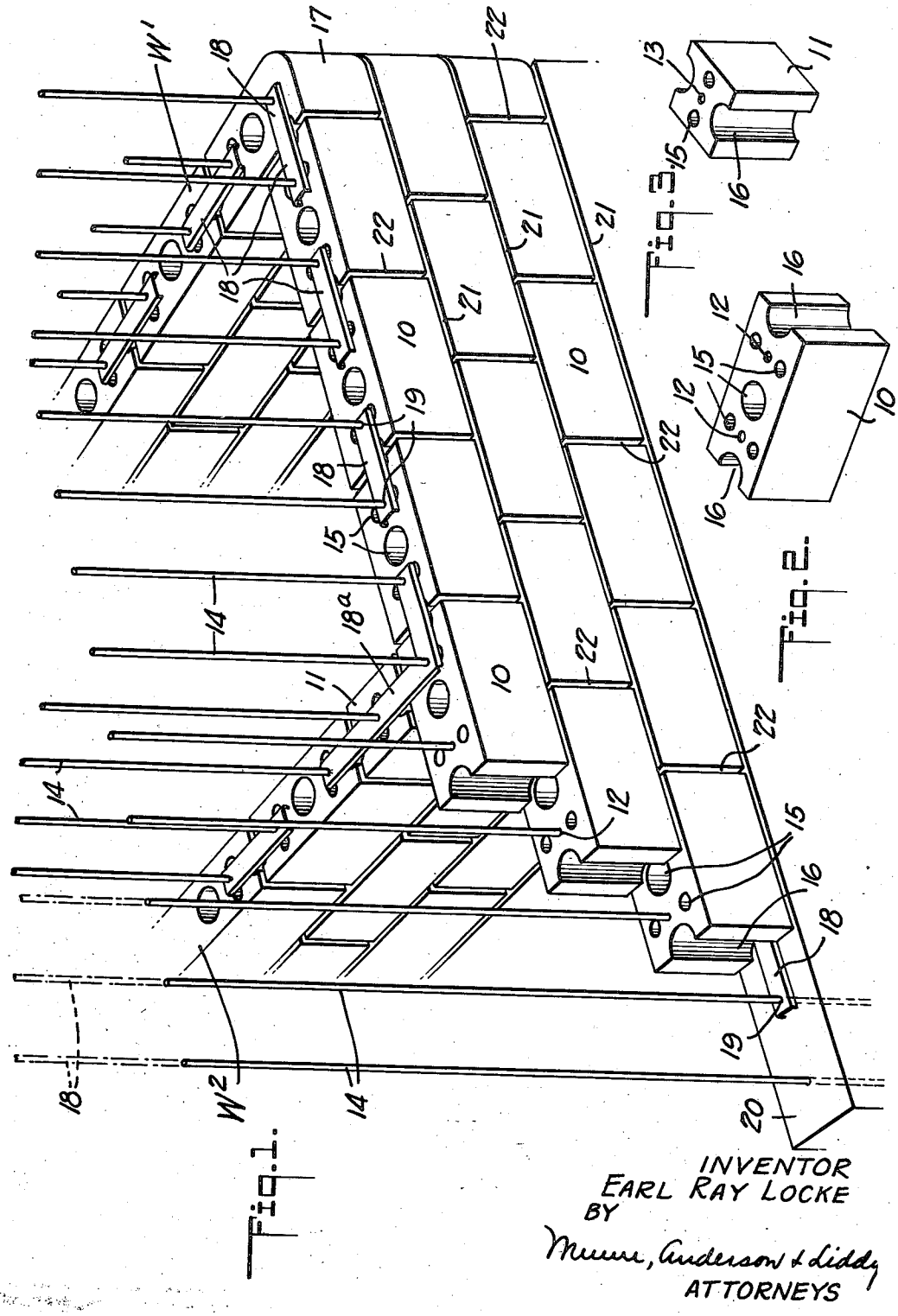

Fig. 1.

Fig. 3.

Fig. 2.

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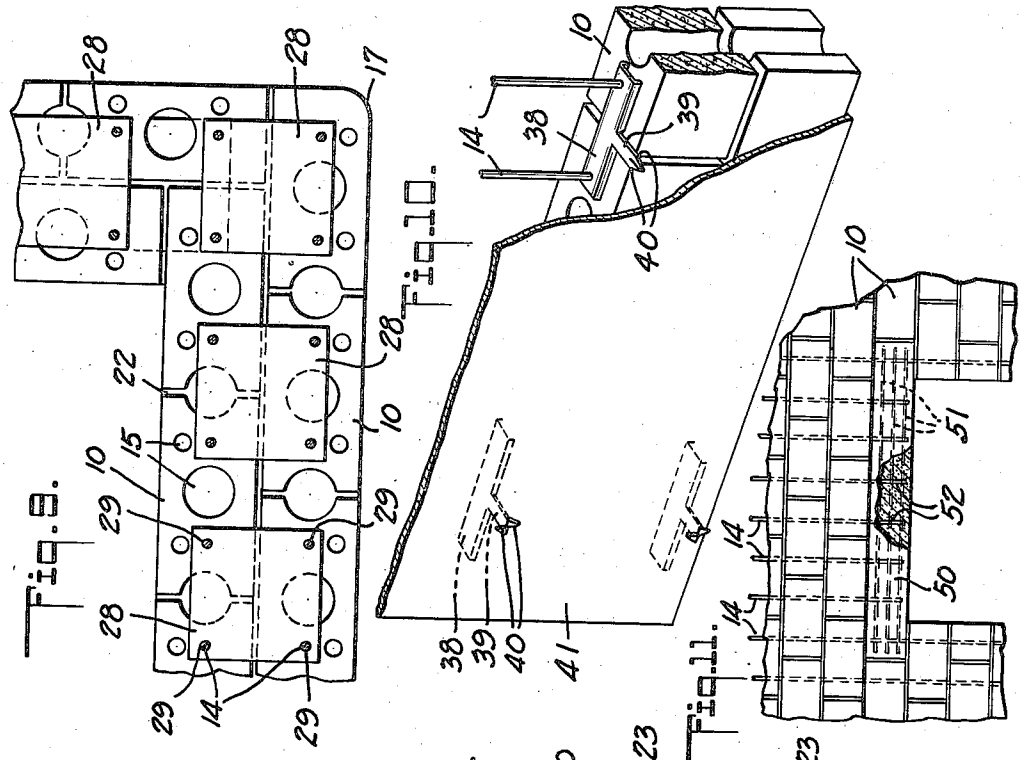

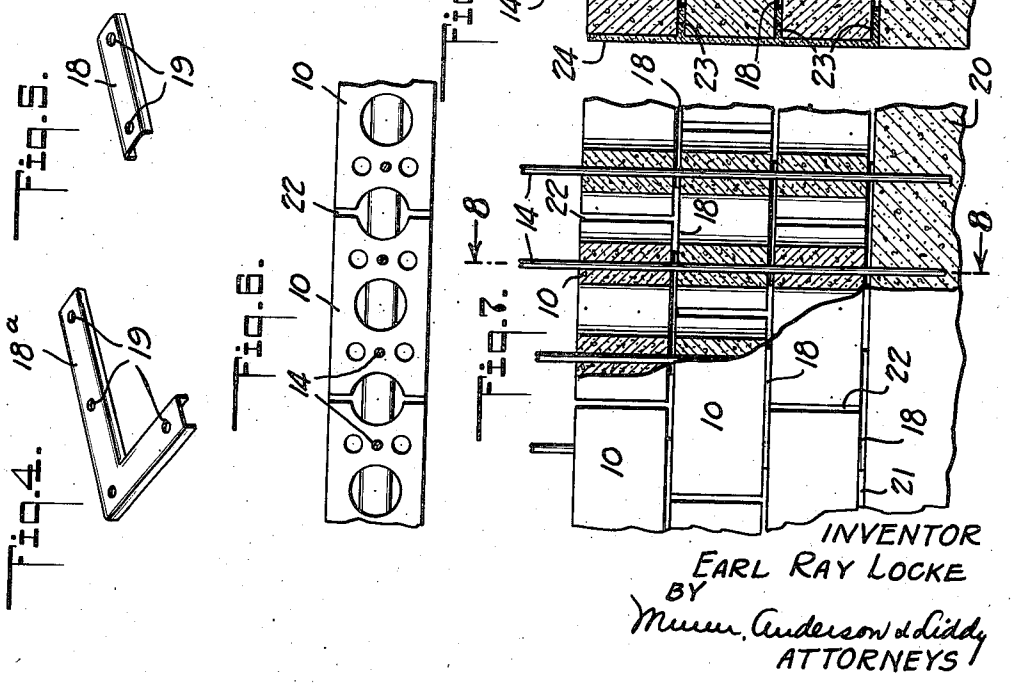

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BUILDING SYSTEM

Earl Ray Locke, Bakersfield, Calif.

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8 Claims. (Cl. 72—40)

This invention relates generally to building systems, and more particularly to wall construction for buildings, bridge footings, dikes and other structures.

An object of the invention is to provide a wall which is constructed of preformed blocks so united as to insure maximum safety against damage by earthquake, windstorm and other disturbances of the elements, as well as being fireproof.

Another object of the invention is to provide a wall in which the blocks are automatically spaced from each other a predetermined definite amount both horizontally and vertically during construction of the wall, for the subsequent application of mortar, grout, or other cementitious material to the spaces by hand troweling or by a cement gun, the blocks being finished by outside stucco or left exposed for painting or other form of finishing coat.

A further object is to provide a wall constructed of preformed blocks wherein the means for uniting the blocks is utilized to attach heat insulating and/or acoustical sheets to the wall to form the inner surface thereof.

Another object is to provide wall construction enabling double walls of preformed blocks to be effectively tied together so that both an outer weatherproof wall and an inner insulating and acoustical wall can be obtained with all of the aforestated advantages.

Still another object is to provide a wall of preformed blocks wherein suitably reinforced girder blocks can be united to other blocks so as to span the sides of door and window openings, and provide adequate support for that portion of the wall above such openings.

With these and other objects in view, the invention consists in the combinations and arrangements of elements as set forth in the following specification and particularly pointed out in the appended claims.

In the accompanying drawings,

Figure 1 is a perspective view of a single wall in the course of construction and illustrating the manner in which the preformed blocks are definitely spaced from each other and tied together both horizontally and vertically;

Figures 2 and 3 are perspective views of a block and half block, respectively;

Figures 4 and 5 are perspective views of typical spacer and tie elements embodied in the invention;

Figure 6 is a fragmentary plan view of a single wall;

Figure 7 is a fragmentary view of a single wall in side elevation partly broken away;

Figure 8 is a vertical transverse sectional view taken on the line 8—8 of Figure 7;

Figure 9 is a fragmentary plan view of a double wall embodying the invention;

Figure 10 is a perspective view of a portion of a single wall and showing the manner of attaching an insulating sheet to the inner side thereof;

Figure 11 is a view of a portion of a wall in side elevation and illustrating a girder block at an opening in the wall.

Referring specifically to the drawings, and particularly to Figures 1 to 8, inclusive, the wall embodying the invention is composed of preformed blocks 10 and half blocks 11 which are rectangular in outline and can be constructed of any suitable material, such as concrete, glass, terra cotta or various substances such as cane fiber, wood bark or straw with a cementitious binder.

Each block 10 is provided with two openings 12 (Figure 2) vertically therethrough, and each half block 11 is provided with a single opening 13 (Figure 3) therethrough, all for the purpose of receiving tie members in the form of metal rods 14, in the assembling of the blocks into a wall. Each block is further provided with relatively large openings 15 vertically therethrough and with end recesses 16 to reduce the weight of the block and to provide dead air spaces in the wall for insulating purposes. Those blocks at a corner of the wall can have one corner rounded as indicated at 17 for artistic effect.

In conjunction with the tie rods 14, combined spacer and tie elements in the form of metal straps 18 are provided. These straps are formed with suitably spaced openings 19 (Figure 5) therethrough to receive the rods 14; and it will be noted from Figures 1 and 4 that certain of the straps can be L-shaped as indicated at 18a for use at the junction of a main wall and a partition. The straps can be constructed of sheet metal bent into channel form as shown, and can be of various thicknesses in accordance with the amount the courses of blocks are to be definitely spaced apart vertically.

In building the wall a level concrete foundation 20 is first constructed and has vertically embedded therein the rods 14 which are definitely and equally spaced apart by the use of a suitable template (not shown), the spacing of the rods corresponding to that of the openings 12 in the blocks 10 and the openings 19 in the straps 18 and 18a.

A sufficient number of the straps 18 are now applied to the rods 18 so as to rest upon the

foundation, following which a sufficient number of the blocks 10 are applied to the rods in staggered relation to the straps as shown in Figure 7, to form the lowermost course of the blocks, it being noted that the length of the blocks is such that when a course of blocks is laid upon the straps, each block will be spaced horizontally from the next block an amount corresponding to the thickness of a strap.

Other straps 18 are now applied to the rods 14 in staggered relationship to the first straps as is shown in Figure 7, followed by the second course of blocks which are also applied in staggered relationship to the first course. Other blocks are applied in courses with intervening straps until the wall has been built up to a height slightly less than the height of the rods which in practice may be from three to four feet above the foundation. The template (not shown) above referred to can now be applied to the projecting upper ends of the rods 14 and then rested on the topmost course of blocks.

The horizontal spaces 21 between the courses of blocks, and the vertical spaces 22 between the blocks of each course are now filled as indicated at 23 in Figure 8, with mortar or cement, by hand troweling or with a cement gun. The outer surface of the blocks can be left exposed in this manner or an outside stucco can be applied to the blocks, as indicated at 24 in this figure.

Upon removal of the template from the rods 14, other and identical rods are welded thereto to extend the height of the rods as indicated in broken lines in Figure 1, following which the tie straps and blocks are alternately applied to the rods as above described. When the second section of wall has been thus built up to the new height of the rods, the cementing of the intervening spaces 21 and 22 between the blocks of the new section is effected. This operation is repeated until the wall has been built to the desired height.

It will be manifest that the blocks of a wall constructed in this manner will be effectively tied together against any and all longitudinal and lateral stresses, and will be definitely spaced both horizontally and vertically during the assembling operation for the subsequent application of cement, to seal the spaces between blocks and complete the wall with either the blocks exposed or covered with outside stucco.

Furthermore, the construction of walls at an angle to each other to provide a second outside wall W' or a partition wall W2 is accomplished by embedding the rods 14 in a foundation at the desired relationship to the foundation 20 and then building such walls concurrently with the building of the first described wall, the half block 11 and the L-shaped straps 18a being utilized at the partition wall to tie the latter to the outside wall as shown in Figure 1. The straps 18 are utilized to tie the angularly related outside walls together at the junction thereof, as also shown in this figure.

In Figure 9 is shown a double wall construction wherein the blocks 10 are assembled on the rods 14 with intervening spacer and tie elements 28 applied to the rods in the manner previously described. However, the elements 28 are in the form of rectangular plates having suitably spaced openings 29 to receive four rods, two in the outer wall and two in the inner wall, so as to tie the two walls together, as well as tie the blocks of each wall together.

In Figure 10 is shown a further modified form of tie strap 38 which is similar to the strap 18 with the exception that it is provided with a laterally projecting tongue 39 intermediate its ends. The tongue is of sufficient length to project beyond a side of the wall when the strap 38 is applied to the rods 14 between intervening courses of blocks; and the free end of the tongue is pointed and split longitudinally to provide bendable prongs 40—40 adapted to puncture a sheet of insulating board 41 when applied to the wall. Following the application of the board 41 snugly against the wall, the prongs 40 are oppositely bent as shown in this figure, to secure the board to the wall. It will be understood that it is not necessary for all of the straps 18 to be provided with the tongue 39, as the boards need only be secured to the wall at a lesser number of places than there are available straps.

In Figure 11 is shown a girder block 50 which can be provided with suitable reinforcing rods 51, and which is adapted to span the top of a window or door opening and support that portion of the wall above the opening. A suitable number of the rods 14 can be set into openings 52 in the girder block so as to conform in spacing to the openings in the straps 18 and thus enable the courses of blocks to be laid successively above the girder and be tied thereto to effectively resist longitudinal and lateral stresses.

What is claimed is:

1. Wall construction comprising a foundation; rods embedded in the foundation and rising vertically therefrom at preselected intervals; blocks having openings snugly receiving the rods so as to be confined thereby in superposed courses wherein the blocks of one course are staggered longitudinally from those of the next course; tie elements having openings snugly receiving said rods and spanning the joints between blocks to definitely space the latter horizontally; the tie elements being disposed between the courses of blocks to definitely space the latter vertically and co-act therewith and with the tie rods in tying the blocks together in wall formation; and a filler in the spaces between blocks.

2. Wall construction comprising a foundation; rods embedded in the foundation and rising vertically therefrom at preselected intervals; blocks having openings snugly receiving the rods so as to be confined thereby in superposed courses wherein the blocks of one course are staggered longitudinally from those of the next course; tie elements having openings snugly receiving said rods and spanning the joints between blocks to definitely space the latter horizontally; the tie elements being of less width than the width of the blocks and being disposed between the courses of blocks to definitely space the latter vertically; and a filler in the vertical spaces and in the horizontal spaces to conceal the tie elements and close the spaces.

3. Wall construction comprising tie members; means for anchoring the tie members vertically in definite spaced relationship; blocks having openings snugly receiving said members to confine the blocks thereto in superposed courses wherein the blocks of each course are spaced apart and the spaces between blocks of one course are offset from those of the next course; tie elements having openings snugly receiving said members and disposed between the courses to definitely space them vertically; and a filler in said spaces.

4. In wall construction, a plurality of tie rods anchored at their lower ends to be vertically dis-

posed in definite spaced relationship; blocks having openings snugly receiving the rods to confine the blocks thereon in superposed courses with the blocks of each course spaced horizontally from each other; and tie elements having openings snugly receiving the rods, and being disposed between the courses to span adjacent blocks and support them in definite spaced relationship vertically.

5. In wall construction, tie members anchored to be vertically disposed in definite spaced relationship; blocks having means co-acting with said members to connect the blocks thereto in superposed courses and with the blocks of each course spaced from each other; means connecting said members and interposed between the courses to span the spaces between the blocks thereof and definitely space the courses vertically from each other; and means on the last means by which a facing sheet is adapted to be attached to the wall to cover a side thereof.

6. In wall construction, a plurality of tie rods anchored at their lower ends to be vertically disposed in definite spaced relationship; blocks having openings receiving the rods to confine the blocks thereon in superposed courses with the blocks of each course spaced horizontally from each other; tie elements having openings receiving the rods, and being disposed between the courses to span adjacent blocks and support them in definite spaced relationship vertically; and tongues projecting from certain of the tie elements, having prongs adapted to puncture sheet facing material and to be bent laterally to attach such material to the wall in covering relation to a side thereof.

7. In wall construction having an opening therethrough, tie rods anchored to be disposed vertically in definite spaced relationship; blocks co-acting with said rods to be confined thereby in superposed courses and to define the vertical sides of a wall opening; and a girder block having means co-acting with certain of said rods to be confined thereby in spanning relation to the vertical sides of the wall opening so as to define the top thereof.

8. In wall construction having an opening therethrough, tie rods anchored to be disposed vertically in definite spaced relationship; blocks co-acting with said rods to be confined thereby in superposed courses and to define the vertical sides of a wall opening; a girder block having means co-acting with certain of said rods to be confined thereby in spanning relation to the vertical sides of the wall opening so as to define the top thereof; other tie rods supported vertically from said girder block in definite spaced relationship; and other blocks co-acting with said other tie rods to be confined thereby in superposed courses supported by the girder block.

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