

[54] WALL CONSTRUCTION BLOCKS AND MORTARLESS METHOD OF CONSTRUCTION

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[51] Int. Cl. E04c 2/46

[58] Field of Search 52/232, 568, 415, 52/585, 1, 607, 389

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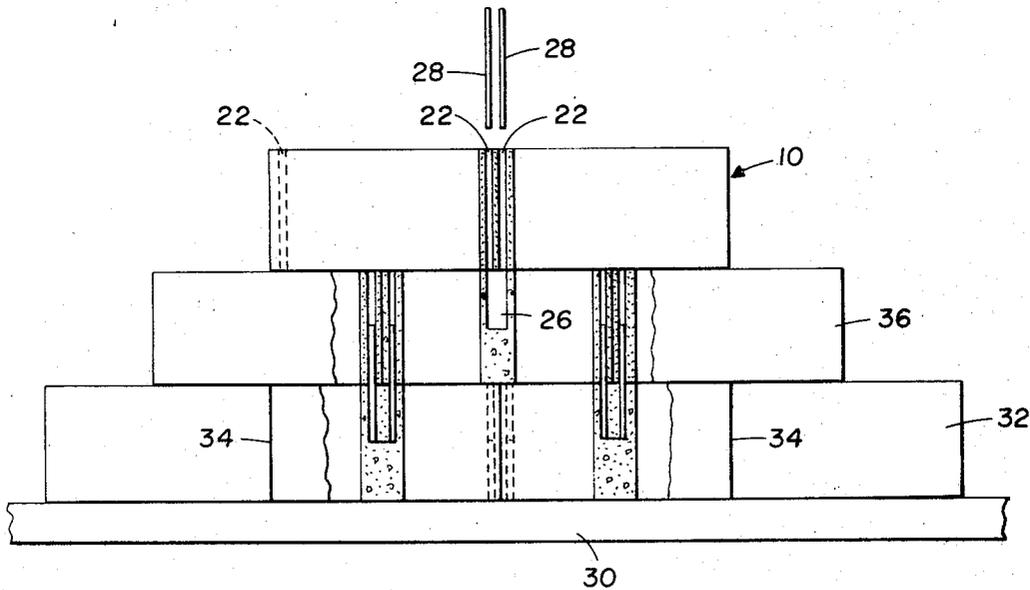
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Assistant Examiner—Leslie A. Braun

[57] ABSTRACT

A mortarless system for constructing a wall from masonry blocks. Each block is coated on its top, bottom, and ends with a material having a relatively low melting point. Each block also has multiple vertical openings, one of which contains a connecting rod held in place by a material, such as wax, having a very low melting point. The blocks are put into place to erect the wall, and then heat is applied to melt the substances which will fuse the blocks together and allow the connecting rods to drop into the blocks in the next lower course to further interlock the individual blocks and form a solid stable wall.

4 Claims, 4 Drawing Figures



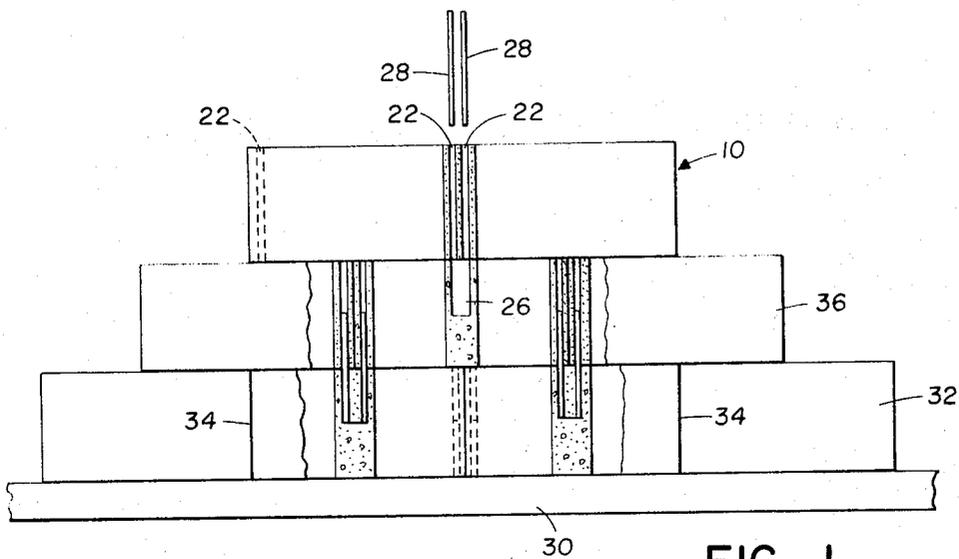


FIG 1

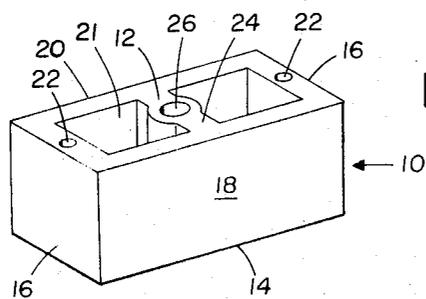


FIG 2

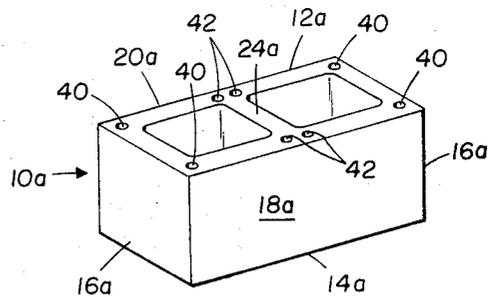


FIG 4

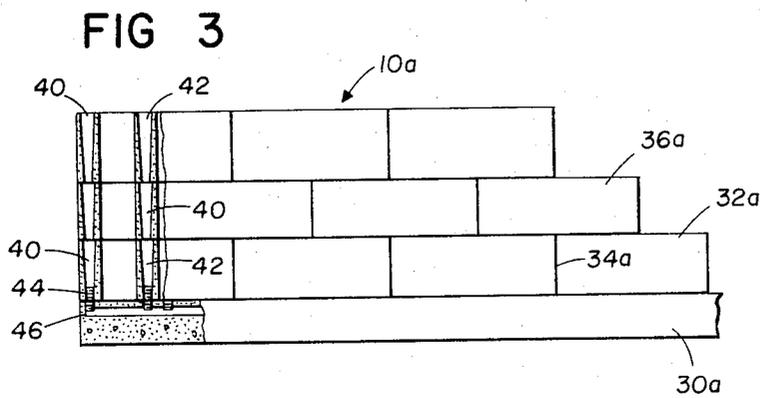


FIG 3

WALL CONSTRUCTION BLOCKS AND MORTARLESS METHOD OF CONSTRUCTION

BACKGROUND OF THE INVENTION

Masonry blocks are a commonly used construction material for erecting walls above grade and also for foundation walls below grade. Although masonry blocks are available in various sizes and types, the method of constructing a wall using them is basically the same. The conventional way of constructing walls using masonry blocks is to spread mortar between the ends of the blocks and between each course of blocks, and when the mortar hardens, a solid stable wall results. This method has been used for many, many years, but requires the skill of a mason, and also requires the mixing and handling of mortar each day on the job site. Moreover, once the wall is constructed using mortar, the wall can be dismantled or torn down only by destruction of the wall with little or no salvage resulting. The wall thus becomes a permanent structure.

SUMMARY OF THE INVENTION

The invention provides a system for constructing walls using individual blocks, preferably of a masonry material, which blocks require no mortar to hold them together. One aspect of the invention involves coating the ends, top, and bottom of each block with a bonding material having a relatively low melting point but which will be solid at ordinary temperatures. The blocks can then be laid in the conventional arrangement but without mortar. When the blocks are properly positioned in the wall structure, heat is applied to melt the bonding material and fuse the blocks together into a solid wall. Another aspect of the invention utilizes individual blocks containing vertical openings therein which will be in alignment when the blocks are laid in their customary staggered positions. Each block is then provided with one or more rods positioned in the vertical openings which rods are held in place during construction by a substance having a low melting point. When heat is applied to fuse the blocks together, the substance holding the rods will melt allowing the rods to drop down into the blocks in the course below thus providing an interlocking arrangement. The invention thus provides for a considerable savings in time and erection of the wall and in labor saving since no mortar need be mixed or applied on the job site. The invention also provides a wall which can subsequently be dismantled and the blocks reused.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevational view of a portion of a wall, partly in section, and showing blocks utilizing the principles of the invention;

FIG. 2 is a perspective view of a block constructed according to the principles of the invention;

FIG. 3 is an elevational view of a portion of a wall partly in section and showing another embodiment of the invention; and

FIG. 4 is a perspective view of a block utilizing the principles of the invention as illustrated by the second embodiment thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

Referring first to the embodiment shown in FIGS. 1 and 2 of the drawings, a wall is constructed of a plural-

ity of rectangular shaped blocks each of which is indicated generally by the reference numeral 10. Each block 10 has a top surface 12 and a bottom surface 14 joined by two end walls 16 and a front wall 18 and rear wall 20. Each block 10 is preferably partially hollow so as to reduce the cost and weight of the block and make the blocks easier to handle. Each block 10 is therefore provided with large rectangular vertical openings 21 which define the interior surfaces of end walls 16, of the front and rear walls 18 and 20 respectively, and a central rib 24. Each end wall 16 of a block 10 is provided with an opening 22 which opening extends vertically through the block 10 from the top surface 12 to the bottom surface 14. In addition, each block 10 is provided in its center rib 24 with a vertical opening 26 which opening 26 is larger in diameter than the openings 22. As best seen in FIG. 1, opening 26 extends from the top surface 12 approximately half way through the block 10 toward the bottom surface 14.

The outer surfaces of end walls 16 and the top and bottom surfaces 12 and 14 are preferably coated with a bonding substance which has a relatively low melting temperature but which is in a solid state at ordinary temperatures. A suitable substance would be glass or one of the many plastic compounds which could be applied in a liquid state and then allowed to harden. In addition, each block has received within each of the openings 22 a rod 28 the length of which is approximately the distance between the top surface 12 and bottom surface 14 of the block. The rod 28 is held in place in the opening 22 by filling the opening with a substance with a very low melting temperature. A suitable substance for this purpose would be a substance such as paraffin or wax.

Using the blocks 10 constructed according to the invention, a wall can now be constructed. As is well known to those in the building industry, a block wall is normally support on a footing 30 which is generally a poured concrete footing. Depending upon the soil type, frost level and weight of the structure to be erected, footings 30 will be poured at a suitable depth. In any event, a first row or course 32 of blocks 10 is laid on the footings 30 with their end walls 16 touching and their front surfaces 18 in alignment. When the blocks 10 are thus laid, the end walls 16 form a joint 34. When the first course or row 32 has been laid, the second course 36 is laid with the bottom surface 14 of each block 10 in the second course 36 resting on the top surface 12 of each block 10 in the first course 32. As in a conventional wall, the blocks 10 in the second course 36 are staggered from the block 10 in the first course 32 with their joints 34 over the center of the blocks 10 in the first course 32. It is important that the openings 22 of two adjoining blocks 10 be directly over the opening 26 of a block 10 in the course below. This procedure is repeated for all subsequent courses until a wall of the desired length and height has been erected.

When the entire wall has been erected, or if desired at intervals during the erection of the wall, heat is applied to the blocks 10 forming the wall. This will cause the wax or other substance holding the rods 28 in the openings 22 to melt allowing the rods 28 by force of gravity to drop down into the opening 26 in the block 10 in the course below. This will, of course, interlock the blocks so that any lateral movement thereof in a horizontal plane cannot take place. To further form the blocks into a solid wall, the heat applied will melt the

bonding substance coated on the end walls 16 and top surface 12 and bottom surface 14 thus fusing the blocks 10 together. If at any time it is desired to dismantle the wall, sufficient heat can be applied to again melt the bonding substance holding the blocks 10 together, and while the bonding substance is still in a liquid state the individual blocks can be separated and removed from the wall, the rods 28 being withdrawn as each block is removed.

In FIGS. 3 and 4 there is shown a second embodiment of the invention. Parts corresponding to those of the first embodiment will be referred to with the same reference numeral followed by the letter "a." Thus, in FIG. 4, there is shown a block 10a having an upper surface 12a and a lower surface 14a parallel thereto which surfaces are joined by end walls 16a a front wall 18a and a rear wall 20a. Each block contains a plurality of openings, there preferably being an opening 40 near each corner of the block 10a and a pair of openings 42 in the center of the front wall 18a and the center of the rear wall 20a. Each of the openings 40 and 42 extends through the block from the top surface 12a to the bottom surface 14a, and each opening is preferably tapered with the widest portion of the opening being at the top surface 12a. As shown in FIG. 3, the blocks 10a are assembled into a wall in a manner similar of that described with the first embodiment with the blocks 10a in the various courses being staggered. With the blocks 10a thus staggered, the openings 40 in a block 10a will be in alignment with the openings 42 of a block 10a in a course below. As each course is laid, the openings 40 are such as that they can receive anchor bolts 44 thus tying each course of blocks 10a together. This makes for a very rigid construction which can be utilized alone or in connection with the coated ends and top and bottom surfaces as described in the first embodiment. Of course, with the construction of this second embodiment, the foundation or footing 30a would have to be provided with openings 46 so as to permit anchoring of the first course of blocks 10a to the footing 30a. With the second embodiment, dismantling of the wall is easily accomplished so that the individual blocks 10a can be salvaged and reused.

I have described my invention in connection with two embodiments thereof and it will be obvious to those skilled in the art that the principles of the invention are applicable to blocks of various masonry materials whether they be concrete, brick or of other material. It is further evident that the principles of the invention can be applied to blocks of a variety of sizes, preferably those presently considered as standard sizes. It is my intention, however, that these and all other revisions and modifications as are obvious to those skilled in the art will be included within the scope of the following

claims.

I claim:

1. A rectangular shaped block for use in constructing vertical walls and the like, said block comprising a solid member of a material having sufficient strength for use in a wall, said member having parallel top and bottom surfaces with a pair of spaced apart cavities extending between said surfaces and defining parallel end walls joined by front and rear walls and a wall central of said front and rear walls, each of said end walls having a vertical opening extending therethrough, said central wall having an opening extending from the top surface part way to the bottom surface, the opening in said central wall being substantially larger than the openings in said end walls, a rod positioned in the opening in each end wall, and means provided to normally hold said rod in said opening, said means being a substance that will release said rod when heat above a normal ambient temperature range is applied to said block.

2. The block of claim 1 in which said substance is a meltable substance that is solid within an ordinary ambient temperature range.

3. The block of claim 1 in which said block has a meltable bonding substance on said top and bottom surfaces and on the outer surface of each of said end walls.

4. The method of erecting a vertical wall using individual blocks each of which has a meltable bonding substance on its top, bottom and end surfaces and each of which has a first vertical opening near each end and a second vertical opening centrally of said first vertical opening, each of said first openings having a rod received therein and held in said openings by a meltable substance that is solid at ordinary temperatures, said method comprising the steps of: laying said blocks in end to end relationship with their front and rear surfaces aligned to form a first course of said wall; laying a second course of said blocks on top of said first course with the blocks in said second course in end to end relationship with the joints between the ends staggered from the joints in said first course so that the first opening in the blocks of said second course are in alignment with the second opening in each of the blocks of said first course; laying additional courses of said blocks on top of said first and second courses with the joints staggered between adjacent courses in the same manner as between said first and second courses; and applying sufficient heat to said blocks to melt the substances on the top, bottom and end surfaces of each block to bond the blocks together and also to melt the substances holding the rods in each block to release said rods and allow them to drop into the second opening of each respective block in the course below.

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