Nov. 25, 1969 G. B. MUSE 3,479,782

CONSTRUCTION BLOCK

Filed Aug. 4, 1967 2 Sheets-Sheet 1

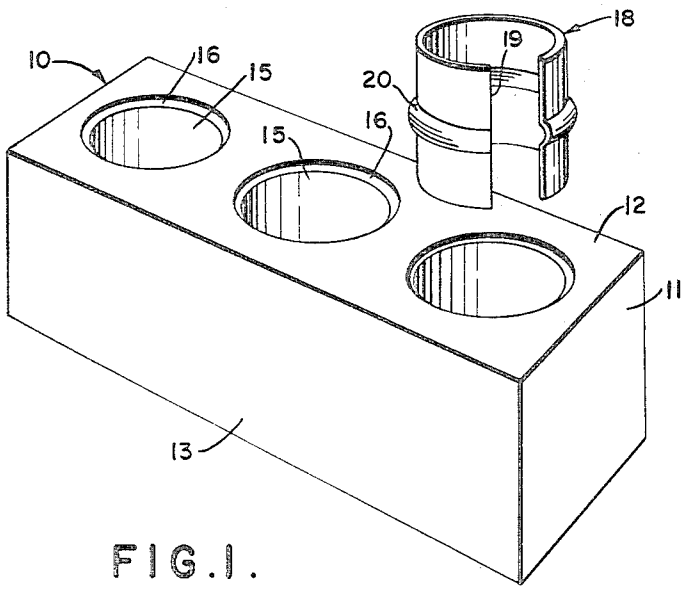


FIG. 1.

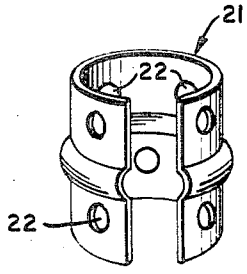


FIG. 2.

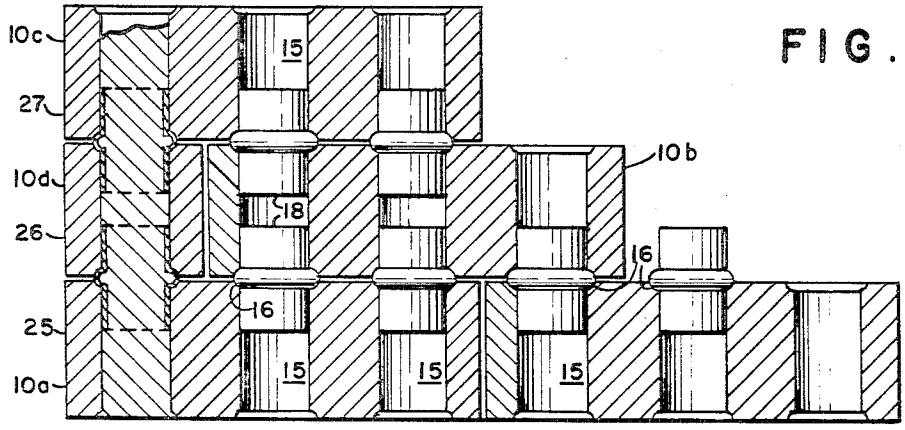


FIG. 3.

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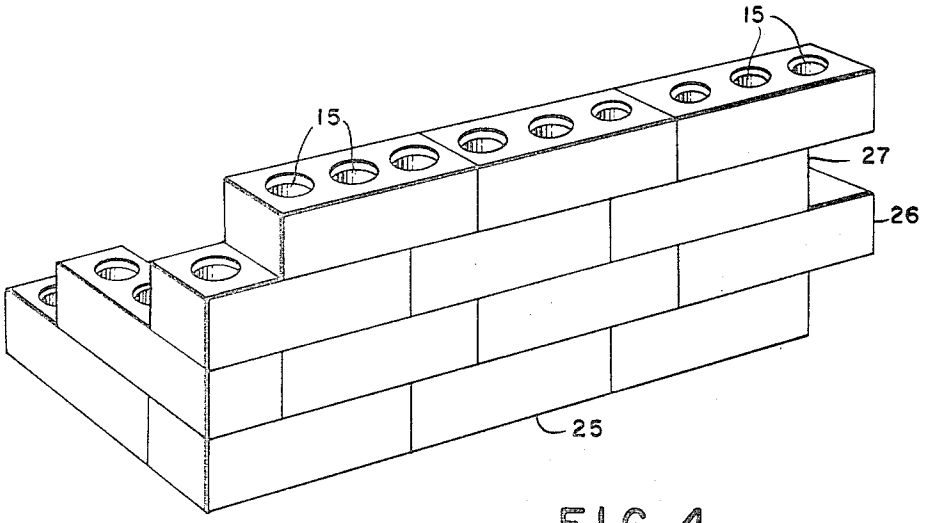


FIG. 4.

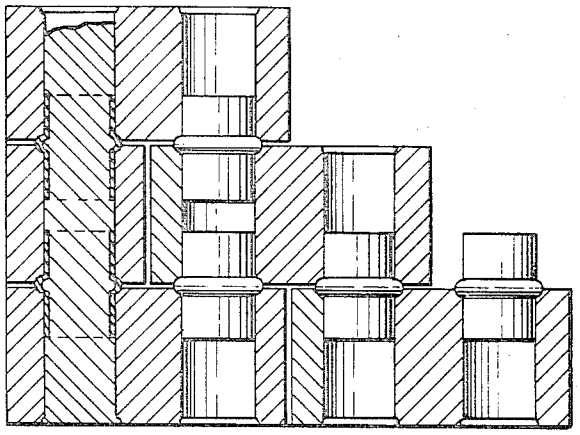


FIG. 5.

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CONSTRUCTION BLOCK

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The portion of the term of the patent subsequent to Mar. 3, 1986, has been disclaimed and dedicated to the Public
Int. Cl. E04c 1/10; E04b 2/10
U.S. Cl. 52—438 3 Claims

ABSTRACT OF THE DISCLOSURE

A construction block of a length approximately three times its width and height, defining centrally located holes in each third thereof along its length. Sleeves are provided to slide in the holes of the block so that several of the blocks may be properly positioned and aligned upon one another by inserting the holes of the blocks of adjacent courses of blocks over one another, about the sleeves. The wall formed by the blocks and sleeves is permanently set into position by pouring mortar through the aligned holes of the blocks and sleeves.

BACKGROUND OF THE INVENTION

In the past, it has been customary to assemble building blocks, such as bricks or concrete blocks, by spreading a layer of mortar over the top and around the sides of the block and then positioning another block upon or adjacent the block. This general manner of assembling blocks with one another has been utilized over the years and is a time tested method upon which few improvements have been made; however, this method of assembling blocks is time consuming, requires great skill and experience in properly aligning the blocks with one another to form a level, straight, plumb wall, requires a ready supply of wet mortar to be maintained at hand throughout the entire period in which the blocks are being assembled, and requires special tools to be constantly maintained at the hand of each mason during the period of construction.

Many attempts have been made to construct building blocks so that they fit in interlocking relationship with one another, in automatic alignment, and so that the blocks can be assembled as a wall, or other structure, without the use of wet mortar, until the entire structure is completed, at which time the mortar is then applied to the structure. In order to interconnect the blocks with one another, the blocks had to be formed in a complicated shape so that they were expensive to manufacture, and the method of applying the mortar to the blocks after assembling the structure has never proven to be satisfactory.

SUMMARY OF THE INVENTION

This invention comprises a construction block defining a plurality of apertures therethrough and sleeves which fit into the apertures of the blocks in adjacent courses of blocks. The blocks are formed of a length twice or three times as long as they are wide and thick, and each half or third of the block defines an aperture located centrally thereof, into which the sleeves are fitted. The blocks are assembled so that their apertures are in alignment with the apertures of a block in the next adjacent course of blocks, and a sleeve extends from the aperture of one block into the aperture of the next adjacent block. After a structure has been formed of blocks and sleeves in this manner, mortar is poured down from the top of the structure through the aligned apertures of the blocks, and through the connecting sleeves, and left to dry, thus forming a rigid structure.

Thus, it is an object of this invention to provide a construction block suitable for rapidly and expediently forming structures without the use of mortar, until the structure has been completed, or partially completed, whereupon the mortar can be applied to the structure.

Another object of this invention is to provide a plurality of substantially identical construction blocks each defining apertures therein, and alignment members for positioning the blocks in alignment with one another.

Another object of this invention is to provide building blocks which are easily aligned with one another when assembling a structure.

Another object of this invention is to provide an alignment member for apertured construction blocks.

Another object of this invention is to provide the combination of a plurality of building blocks and alignment members that enables an unskilled person to build or form a structure without the aid of special tools.

Other objects, features, and advantages of the present invention will become apparent upon reading the following specification, when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is an exploded perspective view of a construction block and a connecting sleeve for insertion into one of the apertures defined in the construction block.

FIG. 2 is a perspective view of an alternate form of the connecting sleeve utilized with the construction blocks.

FIG. 3 is an elevational view, in cross-section of a partially completed wall in which construction blocks and sleeves of the type shown in FIG. 1 were utilized.

FIG. 4 is a perspective view of a partially completed wall constructed of the construction blocks and sleeves.

FIG. 5 is an elevational view, in cross-section, of an alternate form of the construction block.

DESCRIPTION OF THE EMBODIMENTS

Referring now more particularly to the drawing, in which like numerals indicate like parts throughout the several views, FIG. 1 shows construction block **10** having identical end walls **11**, identical top and bottom walls **12**, and identical front and rear walls **13**. While the height of the block, the distance between top and bottom walls **12**, can be varied at will, the length of the block, between end walls **11**, is substantially three times the width of the wall, between front and rear walls **13**. Apertures **15** extend between top and bottom walls **12**, and are centrally located in each one-third of the length of the block. Apertures **15** are of a diameter approximately equal to one-half the width of the block. Annular rings or counter bores **16** are formed about each aperture **15**, in both the top and bottom walls **12** of the block.

Connecting sleeve **18** is generally cylindrical in configuration and defines a slot **19** along its length, so that the diameter of the sleeve can be increased or decreased by expanding or squeezing the sleeve. Sleeve **18** defines an outwardly extending bead or protrusion **20** which extends around the central portion thereof. The sleeve may be fabricated from strips of metal, by forming the bead in the metal and rolling the strip of metal to form the cylindrical configuration of the sleeve. Sleeve **18** is rolled to a diameter approximately equal, or slightly larger than the diameter of apertures **15** of construction block **10**. Bead **20** is sized so as to fit snugly in the annular rings **16** of construction block **10**. Thus, sleeve **18** can be squeezed and contracted, slid into one of the apertures **15**, until bead **20** engages the bottom of the annular ring **16** of the aperture, and allowed to expand again to frictionally engage the interior surface of the aperture. Sleeve **18** is of shorter length than the length of aperture **15** of a block so that the portion of the sleeve extending into the aperture does not extend as much as half way through the aperture. Generally, sleeve **18** will extend approximately one-third

the way into an aperture **15**. With this construction, if one sleeve **18** were inserted into an aperture **15** from the top of a block, and another sleeve **18** were inserted into the same aperture from the bottom of a block, both sleeves could be inserted far enough into the aperture so that their respective beads **20** would engage the inner surface of the annular rings **16** of the top and bottom walls **12** of a block **10**, and the inwardly projecting ends of the sleeves would be maintained a short distance apart.

As is shown in FIG. 2, apertured sleeve **21** can be utilized as a substitute for sleeve **18**. Apertured sleeve **21** is generally similar in configuration to sleeve **18** but includes a plurality of apertures **22** extending therethrough.

A plurality of construction blocks **10** and sleeves **18** or **21** can be utilized to form a wall or similar structure, as shown in FIGS. 3 and 4. A plurality of blocks **10** are placed end to end, in abutting relationship to form a first course or layer **25** of blocks. Sleeves **18** are then placed in the apertures **15** of the blocks, by slightly contracting the sleeves and inserting the sleeves into the apertures until their beads **20** are positioned in the annular rings **16** of apertures **15**. The next layer of blocks **26** is then positioned upon the first layer **25**. The protruding ends of sleeves **18** previously positioned in the first layer of blocks **25** are contracted and the aperture of the block being placed upon the first layer of blocks is fitted over the sleeve, and then wedged down onto the sleeve. Beads **20** of the sleeves prevent the sleeves from being forced down into the blocks of the first layer of blocks during this operation.

The blocks of the second layer of blocks are offset from the blocks of the first layer; that is, block **10***b* is offset to the right (FIG. 3) of block **10***a*. The offset distance of block **10***b* is limited to one-third the length of block **10***a* so that its apertures **15** will remain in alignment with the apertures of the blocks of the first layer of blocks. The third layer of blocks **27** is offset to the left of the second layer of blocks **26**. The blocks of the third layer **27** are positioned directly above the blocks of the first layer **25**.

If the left edge of the structure shown in FIG. 3 is to be the corner of a wall, as shown in FIG. 4, the space between block **10***a* of the first layer of blocks **25** and block **10***c* of the third layer of blocks **27** will be filled with the end of block **10***d*, the length of which will extend in the direction of the intersecting or abutting wall. Since the width of blocks **10** is equal to one-third the length of the blocks, the space between blocks **10***a* and **10***c* at the corner of the construction will be properly filled by the end one-third of block **10***d*, so that a smooth corner construction of the structure is created. Also, the aperture of the end of block **10***d* filling the space between blocks **10***a* and **10***c* will be in proper alignment with the apertures of blocks **10***a* and **10***c* so that sleeves **18** or **21** can be inserted in the aligned apertures, as previously described.

If the structure being built is to terminate at the left edge of the structure shown in FIG. 3, as opposed to turning a corner as shown in FIG. 4, the space between blocks **10***a* and **10***c* can be filled by cutting a block into thirds and inserting one-third of a block in the space. Thus, the aperture of the one-third portion of a block inserted into the space between blocks **10***a* and **10***c* will be in proper alignment with the apertures of blocks **10***a* and **10***c* and sleeves **18** or **21** can be utilized as previously described.

After the structure has been completely or partially completed, it can be inspected and, if necessary, adjusted. If the structure has been improperly formed, it can be disassembled to correct the error, and reassembled in proper fashion. When the builder of the structure is satisfied with his creation, mortar can be poured through the aligned apertures of the blocks **10**, and through the hollow portions of sleeves **18** or **21**, from the top of the structure. The mortar will travel down to the bottom of the column created by the aligned apertures of the blocks, and when the aligned apertures have been filled in this manner, the mortar is left to harden. When the mortar has hardened, a permanent bond will have been created between adjacent blocks and the sleeves inserted in the blocks. The slot **19** of sleeves **18** and **21** will allow the mortar to contact adjacent blocks at their area of abutment between the layers of blocks, and the apertures **22** of sleeves **21** will permit the mortar to contact the interior surface of the apertures **15** of blocks **10**, thus bonding the column of mortar to the blocks in these areas of the sleeve. Of course, the column of mortar in the apertures of the blocks will be bonded to the interior surfaces of the blocks in the area of apertures **15** between the sleeves, in the central portion of each block. Thus, a rigid and positive bond is created by the hardened mortar.

The location of sleeves **15** in the assembled structures of FIGS. 3 and 4 is such that the shearing characteristics of the structure, as might be encountered by one block sliding along another block, are greatly strengthened. After the mortar in the aligned apertures of the blocks hardens, the sleeves effectively surround rigid columns of solidified mortar, and tend to greatly strengthen the columns of mortar at the juncture of adjacent blocks. Thus, the strength characteristics of the structure are greatly increased by the presence of sleeves **15**.

While FIG. 3 shows a sleeve present in each aperture of each block, the mason may find it more expedient in constructing the wall to insert only one or two sleeves in each block. Since it requires only one sleeve in a block to properly position the block with respect to the next adjacent block, the positioning function of the plurality of sleeves in a single block will be substantially performed by utilizing only a single sleeve in a block. Thus, the structure can be assembled with the use of fewer sleeves. When the structure has been assembled, mortar can be poured down all of the aligned apertures. The absence of a sleeve at some of the junctions of apertures **15** will not be detrimental to the wall construction; however, the wall will not be as strong in its resistance to shear forces as it would be if sleeves were inserted in each aperture of each block.

Block **10** is dimensioned so that it can be easily handled and assembled. The proportions of a block, of the length of the block being three times the width of the block, are such that the mason can easily handle the block, and the block is large enough so that a relatively small number of blocks is required to form a structure and the mason is not required to assemble a multitude of small blocks. The presence of annular rings **16** about apertures **15** in each of the bottom and top walls **12** of the block **10**, and the presence of beads **20** about sleeves **18** and **21** is such that the sleeves can be easily inserted into the apertures of the block. The mason merely wedges the sleeve into a block as far as it will go, until its bead **20** engages the annular ring **16** of the aperture, and the next adjacent block is then inserted over the sleeve. The frictional engagement between the sleeve and the block being positioned thereon may be substantial in some cases; however, the cooperation between the beads **20** of the sleeves **18** and **21** with the annular ring **16** of each of the apertures **15** is such that the sleeves are not likely to be inadvertently forced into the aperture of a block beyond its bead. Thus, little attention is required on behalf of the mason in positioning the blocks upon one another.

The resiliency of sleeves **18** and **21** is such that if a sleeve is inserted into an aperture **15** of a block **10**, and subsequently released, the sleeve will expand until it engages the interior surface of the aperture **15**. Thus, the block may be turned over or otherwise handled and its sleeve will not inadvertently drop out of the block.

While the invention has been described as comprising a construction block of a length approximately three times its width, it should be understood that other width and length combinations might be successfully utilized.

For instance, FIG. 5 shows a block having a length twice as long as its width. The assembly of blocks of this type is substantially the same as the blocks previously described. Also, blocks 4, 5, etc. times the width thereof can be utilized in a similar manner. Generally, any block of this general configuration having its length a whole number multiple of its width is suitable for use with sleeves 18 in a structure similar to FIGS. 3 and 4.

If desired, blocks similar to that of FIG. 1 can be utilized in an apertured wall construction as shown in my copending application Ser. No. 624,378. The end apertures of each block can be aligned with the end apertures of blocks in the next adjacent layer of blocks, with sleeves extending into these apertures. Mortar can be poured through the aligned apertures. Since only the end one-thirds of each block will overlap a block in the next adjacent layer of blocks, a space equal in length to one-third the length of the block will remain between the ends of the blocks in each layer of blocks, thus creating an apertured wall structure. Of course, the presence of sleeves 18 and 21 in a wall of this type greatly strengthens its construction.

It will be obvious to those skilled in the art that many variations may be made in the embodiments chosen for the purpose of illustrating the present invention without departing from the scope thereof as defined by the appended claims.

I claim:

1. In a wall structure the combination of a plurality of courses of construction blocks, the blocks of each course being positioned in end to end relationship and the blocks of each course overlying the blocks of the blocks in the next adjacent course, each of said blocks being of a length substantially equal to a multiple of its width and defining circular apertures spaced along its length at positions located centrally in each multiple of its width, each of said apertures being of substantially constant cross sectional area along a major portion of its length and counterbores defined in at least one surface of each block about its apertures, a plurality of tubular positioning members each comprising an expansible generally cylindrical open ended metallic sleeve defining a slot along its length and defining a generally annular external protrusion intermediate its ends, said positioning members being expandable to a diameter slightly larger than the diameter of the apertures of the blocks, the blocks of all the courses of blocks being positioned with their apertures in alignment with the apertures of the blocks in the next adjacent courses of blocks, the tubular positioning members extending into the aligned apertures of at least some of the juxtaposed blocks in adjacent courses of blocks with the external protrusions being positioned in the counterbores of the blocks.

2. The invention of claim 1 wherein said tubular positioning members are shorter in length than the thickness of the blocks.

3. The invention of claim 1 and further including columns of mortar extending through at least some of the aligned apertures and tubular positioning members.

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