June 7, 1949. E. G. MALTHOUSE 2,472,221

ERECTION OF BRICKWORK STRUCTURES

Original Filed May 9, 1944

Fig 1.

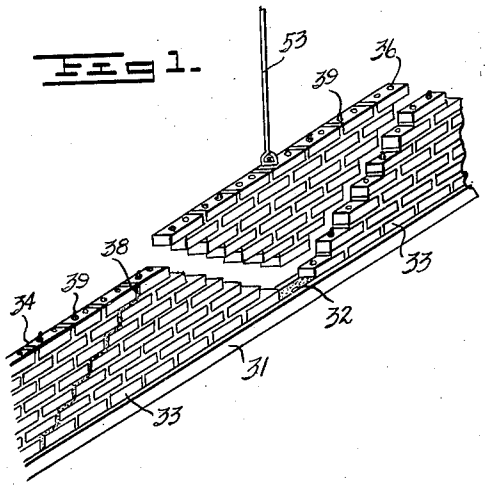


Fig 2.

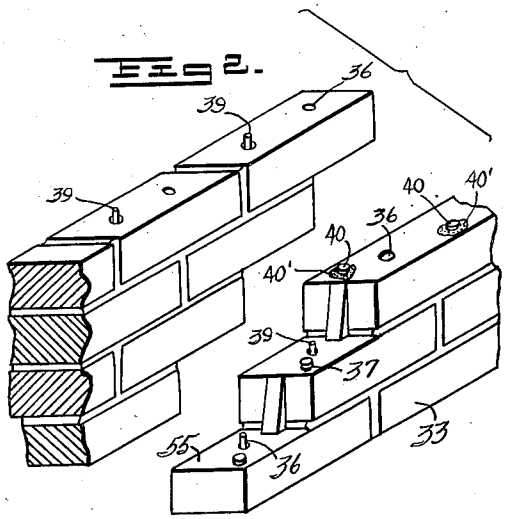


Fig 3.

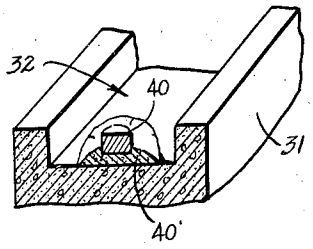
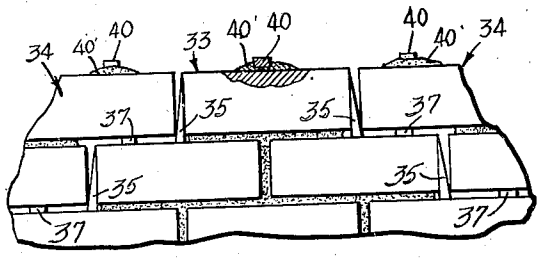


Fig 4.



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ERECTION OF BRICKWORK STRUCTURES

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Original application May 9, 1944, Serial No. 534,761. Divided and this application July 23, 1945, Serial No. 606,488. In Great Britain April 17, 1943

2 Claims. (Cl. 72—37)

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This invention relates to the erection of brickwork structures, and has for its general object the provision of novel and improved methods, products, and apparatus involved in laying up a wall or other structure, utilizing various types of masonry units, for example, the prefabricated brickwork units described in my copending application Serial No. 534,761, filed May 19, 1944 (since abandoned), of which the present application is a division.

The general aim of this invention, as well as those described in the above-mentioned and other of my copending applications, is to make it possible for masonry or other brickwork structures to be erected by relatively unskilled laborers, and to this end the individual bricks or masonry elements may be united by the use of templetes or forms to provide prefabricated subdivisions of the wall or other structure to be erected, all as described in the application to which reference has been made. The subject of the present application comprises the assembly of such prefabricated units, or other unitary or composite building elements into a wall or other structure, by unskilled workmen, without trowelling, plumbing, or pursuing other skilled practices of the expert bricklayer.

More specific objects of the invention are the provision of means for guiding the structural units into perfectly aligned position in the wall, whether those units are provided with a horizontal base or are of a serrated or stepped nature; the provision of spacing elements or distance pieces in order to maintain the proper clearance between the units being assembled, to attain proper alignment, and also to provide space for the cementing material employed; and also to provide spacing or distance pieces of novel configuration for the purpose of not only spacing the constituent elements apart but also guiding those elements during placement.

A further object is to provide methods and means for levelling the distance pieces for the reception of superposed building elements.

Other objects and features of novelty will be apparent from the following specification when read in connection with the accompanying drawings in which certain embodiments of the invention are illustrated by way of example.

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In the drawings,

Fig. 1 is a perspective view illustrating generally a wall construction and the method of erection embodying the principles of the invention;

Fig. 2 is an enlarged view of part of Fig. 1 and shows certain spacing pieces in more detail, those pieces having been omitted from Fig. 1 for the sake of clearness of illustration;

Figure 3 is a fragmentary view partly in vertical transverse section and partly in perspective of a portion of the foundation or footing showing the means for establishing a level for the first course of units, the proportions of certain of these means being exaggerated for the purpose of clearness; and

Figure 4 is a fragmentary view in elevation of a portion of a wall showing the junction of one triangular unit with two adjacent inverted triangular units, a portion of one of the leveling elements and its embedding material being shown in section, and in somewhat exaggerated size.

Although illustrated and described in connection with pre-formed brickwork units such as described in the original application referred to, it will be understood that certain phases of the present invention are applicable to masonry units of a solid or integral character.

In erecting a brickwork structure such as the wall illustrated in the drawings, it is preferable first to lay a concrete or other foundation 31 as suggested in Fig. 1 of the drawings, the foundation being provided in its upper surface with a groove 32 of a width which is governed by the thickness of the wall to be built and the cement to be applied to the groove. However, within the broader scope of the invention, any sort of base or footing may be provided for the wall structure.

In Fig. 1 it will be seen that the wall consists of a plurality of substantially triangular preformed masonry units 33, each of the units having a long horizontal side and a short oppositely disposed side, these sides being connected by end or edge surfaces of a serrated or stepped configuration. First a series of units 33 are laid with their broad sides downward, within the groove 32 of the foundation 31. Then an intervening series of similar units 34 are inverted and lowered into

place in intermeshing relationship with the stepped edges of the previously laid units **33**, as clearly shown in Fig. 1.

In preparing the units **33** and **34**, according to the method described in my copending application, the individual bricks may be provided with pairs of openings, the associated openings in the units providing passageways **36** leading vertically therethrough. Certain of these passageways disposed at intervals along the units may be provided with reinforcing rods **39**, the ends of which project slightly from the passageways which they occupy. By suitably alternating the rods **39** and empty passageways, means are provided for not only reinforcing the units but also for assisting the bonding of the units by the interlocking of the projecting ends of the rods with the adjacent openings or passageways in the mating units.

Some of the protruding ends of the reinforcing bars **39** may be screw-threaded for the attachment of bars, eyes, or the like, to be engaged by the hoisting tackle **53** as suggested in Fig. 1.

The units **33** and **34** may be laid up in ordinary cement or mortar to provide the bonding joint **38**, but in line with the general purposes of the invention, it is preferred that the bonding processes subsequently described herein be pursued.

In order to govern the thickness of the joints **38** between the units **33** and **34** there are provided a plurality of small distance pieces **37** which may be in the form of round buttons preferably made of some ceramic material and scattered at random upon the horizontal surfaces **55** of the stepped edges of the units **33**. Also, in order to gauge the horizontal spacing of the units **33** and **34** and to guide the units **34** into position, there are provided the triangular wedge pieces **35**. These pieces are of a cross-sectional configuration corresponding to a right-angled triangle, the short base portion of which rests upon the horizontal surface **55** and the longer vertical side of which rests against the vertical surface **56** of the stepped edge of the unit. Thus when the units **34** are lowered into place, portions of the serrated edges thereof will contact with the inclined surface of the wedge pieces **35** and be guided into proper position. The horizontal surfaces of the superposed unit **34** will finally come to rest upon the distance pieces **37** and in this position the corresponding vertical surfaces **56** will be properly spaced apart by the base thickness of the wedges **35**. The above described method and structure are amply exemplified in Figure 4 of the drawings.

When the units **34** have thus been set in place the joint **38** is grouted with a liquid cementing mixture, and preferably guiding and retaining elements are applied to each side of the joint as shown in Figure 8 of my United States Patent No. 2,438,613. These elements are provided with bevelled or sloping portions which also serve to assist in guiding the subsequent units into place.

Having erected a row or course of units **33** and **34**, distance pieces **40**, of the same character as the pieces **37**, are covered on the under side with plastic bedding or jointing material **40'**, such as cement in a plastic condition, and then laid on the exposed upper bonding faces of the units **33** and **34**, forming one course of the wall. These distance pieces **40**, embedded upon their pats or mounds of cement, mortar, or other bedding or bonding material, are levelled, conveniently with the aid of a theodolite, along the complete row of the units **33** and **34** which have been erected.

Distance pieces which are too low are raised by the addition of more plastic bedding and jointing material, and those which are too high are depressed in their applied bedding and bonding material.

After the bedding and jointing material seating the distance pieces **40** has set, a second course of the brickwork units is erected in the same manner as previously described in connection with the first row or course of units.

It will be appreciated that the foundation grooves **32** in the footing or foundation **31** may be levelled by the use of similar distance pieces **40** in the manner just described, before the first row of units **33** is laid, as shown for example in Figure 3.

Similar channel guides, of the type disclosed in my aforesaid Patent 2,438,613, may be disposed in horizontal position and used in connection with the laying of the initial units **33** of succeeding courses of units. Specific reference is made to Figures 3, 4, and 5 of the above mentioned patent.

It is understood that various changes may be made in the embodiments illustrated and described herein without departing from the scope of the invention as defined by the following claims.

In the appended claims, the phrase "a previously-laid foundation" is to be read as including a foundation proper for the reception of a first course of units, or a foundation formed by a course of units ready to receive a subsequent course.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. The method of erecting a masonry wall structure of large preformed units in simulation of individually-laid bricks or blocks, said units being laid up in the wall with plastic bonding material, said method consisting of laying a plurality of distance pieces each on a quantity of plastic jointing material placed upon a previously-laid foundation, bringing the distance pieces to a predetermined level while the jointing material remains plastic; allowing the jointing material to set; lowering preformed units vertically into position until the bases of the units rest on the distance pieces, the joint between the units thus being formed to a thickness determined by the height to which the distance pieces have been levelled; completing a whole row of such preformed units, and repeating the application of levelled distance pieces and the lowering of further preformed units upon the upper surface of the row to form another row of bevelled units, the operation being continued until the whole structure reaches the required height, the interstices between the units being filled in with plastic bonding material.

2. The method of erecting a masonry wall structure of large preformed units in simulation of individually-laid bricks or blocks, said units being laid up in the wall with plastic bonding material, said method consisting of laying a plurality of distance pieces each on a quantity of plastic jointing material placed upon a previously-laid foundation, bringing the distance pieces to a predetermined level while the jointing material remains plastic; allowing the jointing material to set; assembling on the foundation a row of preformed units some at least of which have stepped end surfaces adapted to intermesh with each other, by lowering the units

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vertically into position until the bases of the units rest on the distance pieces, the joint between the units thus being formed to a thickness determined by the height to which the distance pieces have been levelled; placing distance pieces also on the horizontal surfaces of the stepped end of one unit before the placing of another unit, and repeating the application of levelled distance pieces and the lowering of further preformed units upon the upper surface of the row to form another row of levelled units, the operation being continued until the whole structure reaches the required height, the interstices between the units being filled in with plastic bonding material.

ERNEST GOODALL MALTHOUSE.

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