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MASONRY STRUCTURE AND UNITS USED THEREWITH

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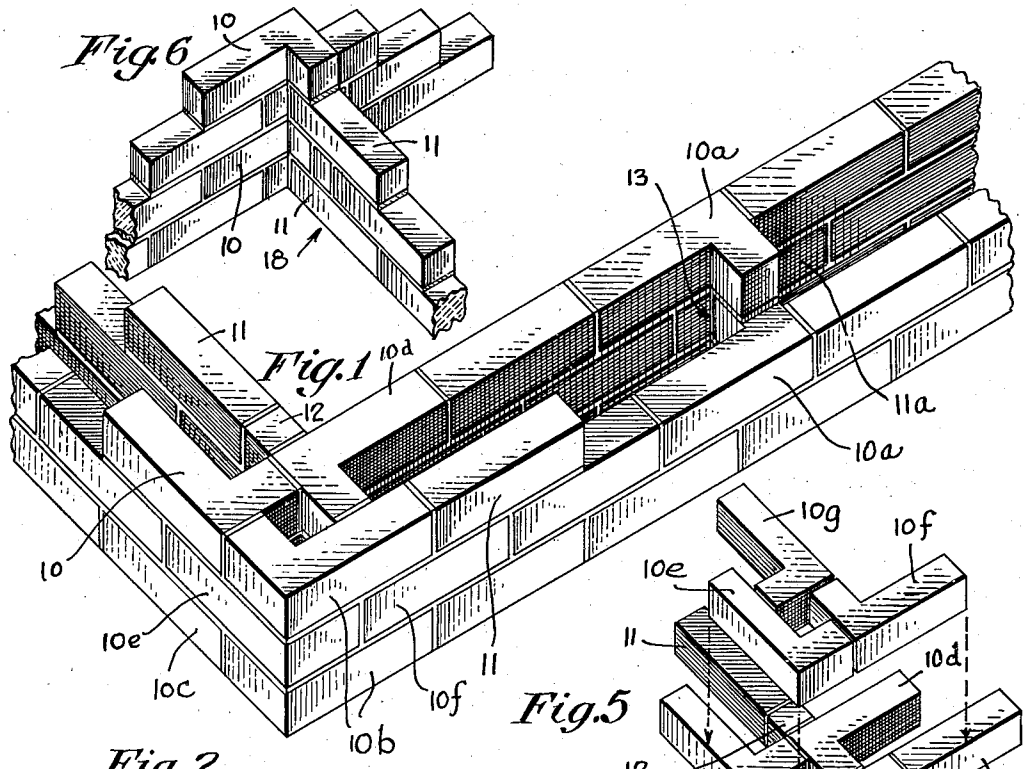


Fig. 6

Fig. 1

Fig. 5

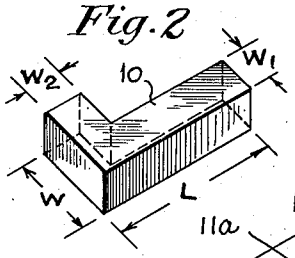


Fig. 2

Fig. 3

Fig. 4

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MASONRY STRUCTURE AND UNITS USED THEREWITH

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2 Claims. (Cl. 72—39)

The present invention relates to masonry structures and units used therein.

In building masonry structures, it is frequently desired to employ multiple walls in which the inner and outer walls, and occasionally one or more intermediate walls, are spaced from each other to provide vertical channels or air spaces insulating the walls from each other against the transfer of heat and moisture.

However, in many cases where multiple walls would be desirable, for instance, in low-cost housing where the inner walls could be finished smooth, with or without plaster, and with or without paint, the cost of the double thickness of bricks or other masonry units is prohibitive considering the strength required and the purpose for which the structure is to be used.

In building multiple walls, the bricks in the several wall sections are laid flat or on edge and usually bonded together at intervals by a header course of transversely laid bricks or metal ties, but this is not always satisfactory, for the header course of the cross-laid bricks changes the pattern of the wall and with the metal ties the transverse strength of the walls is decreased. Also, the laying of the transverse bricks or metal ties requires extra time and careful attention, which further increases the cost of the wall.

Heretofore, it was proposed to avoid this extra time and work by providing a masonry unit in the form of a brick which has an integral lug projecting at right angles, the brick having adjacent vertical faces each equal to the front face of a standard brick. In building the wall, the bricks were so laid that the lugs on the outer wall would over- and under-lie the lugs in the adjacent courses of the inner wall. The wall sections would thus be bonded together, but still a large amount of material would be required and the minimum double wall which could be built would be twelve inches thick, using the standard bricks which are eight inches long. Moreover, because of their proportions and shape, the lug-formed bricks of the prior art could not be used to make a strong interlocked corner structure and it was necessary that the standard common bricks be used to build up the corners in the usual manner.

An object of the present invention is to provide an economical multiple wall structure using a minimum of material and yet one in which the wall sections may be securely bonded together with a minimum of time and work.

To this end, the present invention provides a masonry unit or brick which in volume or mass is less than the corresponding standard brick and yet which has adjacent vertical faces which are the same as the end and front face of the standard brick, or are in proportions thereto.

If the present invention is incorporated in units having dimensions greater than those of the standard brick, though retaining the same proportions, then it will have a volume less than the corresponding volume of the standard brick or a brick having the dimensions employed.

This is accomplished by omitting a section of the brick at its back and one end, leaving whole the front or stretcher face and the other or header end, which would be the exposed end of the brick at a corner.

This special unit or bonding brick is used according to the present invention in the form at present preferred with bricks of half the width of the unit to build up the wall sections, the bonding brick being used to tie the wall sections together by being laid flat with the lugs of the special units in the respective wall section in superposed relation, and to tie in partitions while the half-thick bricks are used at all other places. This makes a double spaced wall which is only six inches thick (with standard brick dimensions), uses much less material than this kind of wall made with standard brick and yet which has the outside appearance of a wall made with standard bricks.

A feature of the invention resides in the arrangement of the special units in the walls so that the lug thereon in tying the walls together abut against the units in the other wall section at points spaced from the vertical joints of the other wall to give increased strength to the wall and eliminate through vertical joints.

The special units of the present invention are used to form a strong rigid corner structure with the walls tied thereto, the corner having at least three points of interbonding in each course with the units reversed in alternate courses so as to produce a closed box or pillar.

Walls of the desired strength may be produced with units of the present invention by interconnecting and interbonding two, three or more walls in parallel relation. If desired, additional strength can be given to the wall by providing the L bricks with apertures through which steel rods or other reinforcing means can be inserted.

Further, with the units of the present invention, the separating walls for dividing the interior of the building or structure may be integrally bonded and secured to the inner wall section for the full height thereof.

In the broader aspects of the invention, the part removed from the brick of standard proportions to form the special unit may vary to satisfy air space and load requirements so long as the width of the stem of the unit is a fraction of the width of the unit. The other units used with this special unit in building up the wall should have the same width as the width of the stem of the special unit.

Other features and advantages of the invention will be apparent from the specification and claims when considered in connection with the drawing in which:

Figure 1 is a perspective view of a double wall.

Fig. 2 is a perspective view of a special building unit.

Fig. 3 is a perspective view of a triple wall structure.

Fig. 4 is a perspective view of the wall showing a reinforcing means in position.

Fig. 5 is an exploded view of a corner showing the relative positions of the units therein.

Fig. 6 is a perspective view of the inner wall section and a partition wall formed integrally therewith.

As shown in the drawing, the walls of the present invention are made up of special units **10**, straight units **11** and may include spacer units **12** if a half bond is desired. The units are arranged in a manner as will be hereinafter described. For the purpose of clearly illustrating and describing the invention, the units will be described in terms of the dimensions of the standard brick. It is to be understood that these dimensions are not limiting dimensions, but units may be made of different sizes so long as they retain substantially these overall proportions.

The dimensions of the units are approximate and a satisfactory structure will be produced if the dimensions are maintained substantially to the proportions noted in connection with the discussion of the individual units.

The special building units **10** shown in Fig. 2 have substantially the same dimensions as a standard building brick, that is, its length is eight inches, its width is three and three-quarter inches, and its height is approximately two and one-quarter inches. This provides a pair of adjacent vertical faces having the appearance of a standard brick. The back part of the brick is cut out so that an L-shaped unit is formed, the width of the brick along the stem of the L and the width of the lug of the L being approximately two inches. The amount of cut out may vary with the requirements of the wall. In any case, the width of the stem will be less than the width of the unit.

In the illustrated form of the invention, the proportions of the unit with respect to the length L of the brick are that the width W is approximately one-half of the length L, and the width of the stem W^1 and lug W^2 is one-quarter of the length L. These proportions may vary within reasonable limits without defeating the accomplishments of the invention.

The straight units **11** are substantially the same length and height of the L units and have a width substantially equal to the width of the stem W^1 of the special unit. As here illustrated, the width is one-quarter of the length or two inches.

The spacer unit **12** is a short section which in practice is cut from the straight unit **11**. It is used to properly space the straight and special units in the wall to obtain a half masonry bond. It has the same width as the straight unit, and, as illustrated, has a length equal to one-quarter of a straight unit. If it is desired to have a wall with a three-quarter masonry bond, the spaced unit is omitted.

The building units, thus described, when laid up into a double wall, provide a wall of minimum depth having the two wall sections interbonded through the height thereof at predetermined intervals and an air space therebetween.

As shown in Fig. 1, the special units **10** and straight units **11** are laid in courses with the special units and straight units in the two wall sections arranged so that the projecting lug of the L of one wall section extends into the space between the two walls at a predetermined position and overlies and bonds with the lug on the L in the other wall section in the course below. This is shown in relation of units **10***a* and **11***a* in Figs. 1 and 3.

When laying up the wall, the L in one wall section abuts the inner surface of a brick in the other wall section at a distance one-quarter of the length from the vertical joint as shown at **13** in Fig. 1. It will thus be seen that there will be no through vertical joints in the wall and a strong and watertight wall will be produced.

The building units of the present invention may be laid up to produce a strong and sturdy corner structure which ties in the two walls and provides a complete interbonding and tying in between the walls at the corner so as to form a rigid vertical box or pillar.

As best shown in Fig. 5, the corner is made up of three special or L units in each course in abutting relation. It will be noted in the first course that the unit **10***b* in the outer wall forms the corner with its header face to the left, and the end of the lug abutting the end of unit **10***c*. Unit **10***c* has the lug projecting toward the inner wall and its end abutting the end of unit **10***d* of the inner wall. Unit **10***d* has the end of its lug abutting the stem of unit **10***b* of the outer wall. All of the units are interbonded so that they form the sides of the rectangular corner structure.

In the second course, the units are reversed, and unit **10***e* of the outer wall overlies and extends over parts of units **10***b* and **10***c* with the header face facing the right. The end of the lug of unit **10***e* engages the end of unit **10***f* in the outer wall which overlies the joints between unit **10***b* and the adjoining straight unit **11**. The end of the lug of unit **10***f* abuts the end of unit **10***g* of the inner wall and overlies the joint between units **10***b* and **10***d* in the lower course and the connection between **10***b* and the straight unit **11**. Unit **10***g* has the end of its lug abutting the stem of unit **10***e* and covers the connection between units **10***c* and **10***d*, with its stem overlying the straight unit **11** and the spacer unit **12** on the inner wall. The three units **10***e*, **10***f* and **10***g* in the second course are all interbonded and overlie and tie in together the units in the first course. This process is repeated throughout the building of the wall so that a strong interbonded corner structure is provided, and, as shown in Fig. 1, the exterior of the corner has the appearance of being made up of standard units.

With bricks of the present invention having standard brick dimensions, a double wall structure with an air space can be produced which has a maximum depth of six inches. This is a great saving in material over the walls here-

tofore produced, for the smallest double wall made prior to the present invention was at least eight inches deep. When an air space was provided, it was usually at least ten or twelve inches in depth. The present invention, therefore, by saving a substantial amount of material, has greatly reduced the cost of the wall so that walls of this type may now be used in place of wooden constructions in low-cost housing now being developed. This is a tremendous advantage since brick structures are more durable and have less upkeep.

The cavity wall of the present invention, in addition to saving material, will provide space for burying the plumbing and other pipes, electrical conduits, and other wiring. Also, if the air space between the walls is not sufficient as an insulator, additional insulating material can be placed in the cavities.

In laying up the wall of the present invention, the exposed surfaces of the inner and outer walls may be "laid to line" and thus provided with smooth surfaces. The inner surface, if desired, can be painted over and used without further plastering or other treatment, or the paint may be omitted, or furring strips can be provided at any time or the walls plastered directly thereon later. In some instances the inner wall may be made of light colored brick and painting and plaster eliminated. Such walls can be readily washed at any time. These are further advantages when used as walls in a low-cost housing project or factory structure.

If the six inch wall is not sufficient for the load requirements, the present invention may be embodied in a multiple wall structure having three or more wall sections as required. This is accomplished, for example, in the three section wall shown in Fig. 3 by incorporating an intermediate wall having straight and special units with the lugs on the special units projecting from both faces thereof and tying in with similar units in the outer two walls in the manner previously described. With standard brick dimensions, the depth of the double wall will be increased by four inch increments for each additional wall section.

The walls may be further strengthened by providing aligned apertures **16** in the lugs of the special bricks and inserting a steel rod **17** or the like therethrough to reinforce the same as shown in Fig. 4.

Another feature of the present invention resides in the arrangement wherein a separator or partition wall **18** can be integrally joined and bonded to the inner wall section. Such an arrangement is shown in Fig. 6, wherein the inner wall is provided with special units **10**, the lugs of which project from the face thereof, and the partition wall **18** is laid so that the straight units **11** thereof interlock with the projecting lugs and tie the partition wall to the inner wall section for the full height thereof.

In the broader aspects of the invention, I am the first to build a double wall structure of a whole and fractional brick depth, with the whole and fractional bricks arranged in courses in each wall section so that the whole brick portions in adjoining courses are in overlapped relation.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

I claim:

1. In a multiple wall structure having a plurality of wall sections connected by a corner comprising a plurality of L units having a pair of adjacent faces substantially of the same proportions and dimensions as a standard brick in each course of the wall sections, said units being secured together in abutting relation and the units in adjoining courses being reversed and interbonded with the course below, with the faces of standard brick proportions and dimensions of the unit exposed in the face of the wall.

2. As an article of manufacture, a building unit of standard brick proportions and dimensions having a portion of the back removed to form an L-shaped unit.

AUGUST J. BOHN.