Aug. 21, 1928. 1,681,631

D. TAMBONE

INTERLOCKING BRICK CONSTRUCTION

Filed April 10, 1926

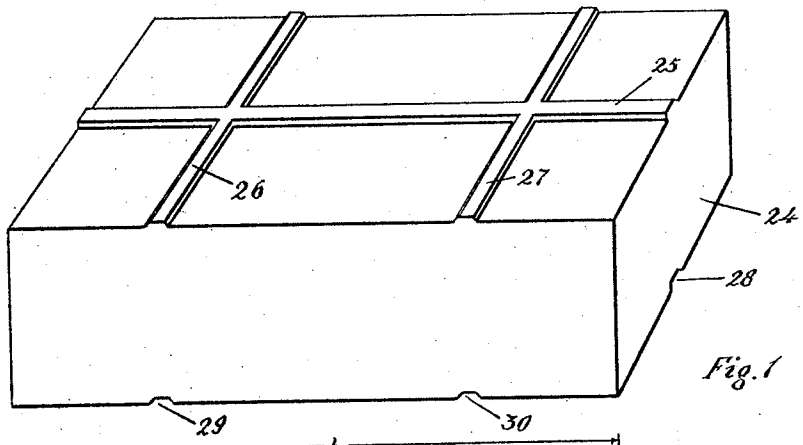


Fig. 1

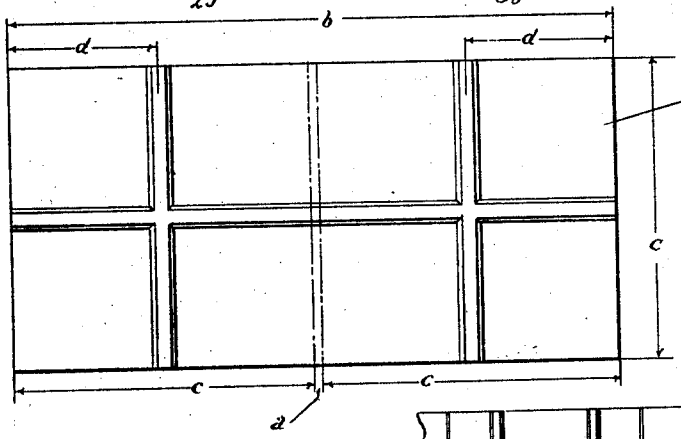


Fig. 2

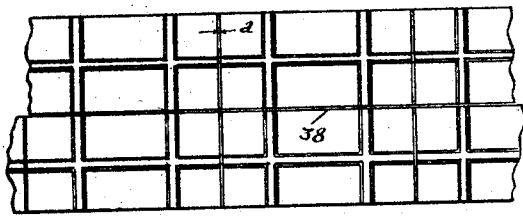


Fig. 3

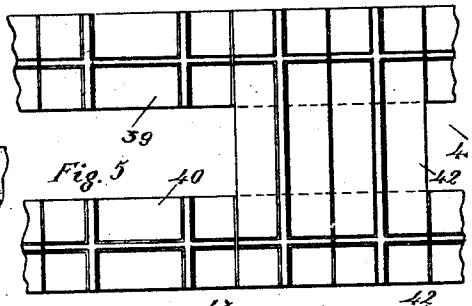


Fig. 5

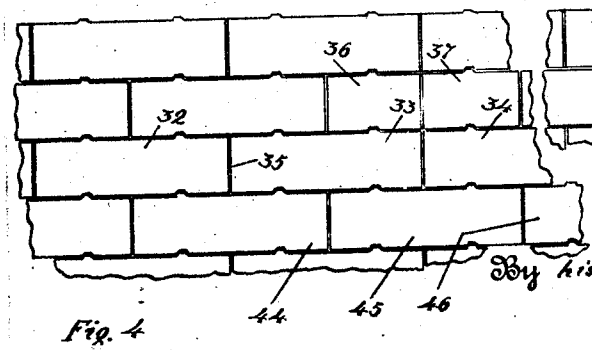


Fig. 4

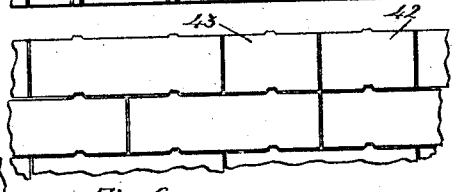


Fig. 6

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By his Attorney

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UNITED STATES PATENT OFFICE.

DOMINICK TAMBONE, OF NEW YORK, N. Y.

INTERLOCKING-BRICK CONSTRUCTION.

Application filed April 10, 1926. Serial No. 101,199.

This invention relates to improvements in building construction and more particularly to the construction of walls by means of interlocking elements suitably designed to answer the requirements of all practical purposes, permitting the production of relatively light and at the same time rigid structures having a high load supporting capacity and capable also of effectively resisting the effects of earthquakes and other disrupting agents.

The primary object of this invention is to provide an interlocking brick or block of an improved design which may be used for general construction purposes and which is especially suitable for those constructions which are exposed to the action of disrupting agents such as earthquakes, or to a high temperature such as obtains in furnaces of various kinds, etc.

Another object of this invention is to provide a novel and improved design of brick or building block which is adapted to interlock with other similar elements in any position in which the brick or block may ordinarily be laid, the resulting structure allowing for the necessary spaces between bricks or blocks for the insertion of mortar between adjoining elements.

A further object is to provide an improved system of wall construction, in which interlocking bricks or blocks are used, so designed as to be interlocking with one another in any position in which said bricks or blocks may ordinarily be laid, allowing the necessary spaces between adjoining elements for the insertion of mortar or other binder used.

Other objects and advantages of the present invention will more fully appear as the description proceeds and will be set forth and claimed in the appended claims.

One of the main causes of damage to brick buildings subjected to earthquakes lies in the absence of a bond of an interlocking nature between the bricks of which a structure may be composed. Due to the fact that in ordinary brick buildings, the binding action between adjoining elements is provided entirely by the mortar, the bricks themselves having flat surfaces all around, there is lacking a sufficient rigidity in the structure in a lateral direction, and this permits ready disruption of walls and other parts of the building, especially in such cases where the mortar used is of relatively poor quality.

In other instances, when brick walls are exposed to exceptionally high temperatures as is the case in furnaces of various kinds, the structure will disintegrate in a relatively short time due to the expansion and contraction taking place during periods of heating and cooling; and the result is that frequent repairs are needed including replacements of bricks and linings, which are a constant source of inconvenience and expense.

The resisting qualities of a wall may therefore be greatly increased by using in its construction elements which are interlocking with one another and which provide that rigidity of structure which would otherwise be lacking. In a broad sense, this idea is not new, since interlocking bricks or building blocks of various designs have heretofore been used; but in so far as I know these bricks and blocks have failed to answer the requirements of constructions generally in use, especially in this, that they fail to allow for the proper interstices between adjoining bricks or blocks for the insertion of mortar.

In other words, those bricks and blocks of the interlocking type which are known to me are so designed that when used in building a wall, the resulting structure is solidly occupied by the bricks or blocks which are abutting directly against each other, and there is no room left for a binder of any kind. This results in the binding action between the bricks being left entirely to the interlocking joints, and this condition, of course, is not sufficient to provide the necessary rigidity in a horizontal sense and totally fails to provide a binding action in the vertical sense.

The brick or block forming one of the objects of the present invention is designed to overcome this condition and to provide a building material affording the desired

interlocking action, at the same time providing a suitable space between adjoining elements for the use of mortar in the usual way; this being obtained by a special arrangement of the interlocking means which are suitably located in relation to one another, so as to cause proper positioning of the various bricks or blocks to automatically take place when the wall is constructed.

The inventive idea may be applied in a number of different ways, and a typical example which is illustrated in the drawings, has already been illustrated and described by me in another patent application for earthquake proof building construction, filed by me February 17th 1926, Serial No. 88,749; and referring to said drawings

Fig. 1 is a view in perspective of an interlocking brick or block such as may be used in my improved type of construction;

Fig. 2 is a plan view of the same;

Fig. 3 is a fragmentary plan view of a solid wall built by means of the brick or block illustrated in Figs. 1 and 2;

Fig. 4 is a fragmentary front elevation of the same;

Fig. 5 is a fragmentary plan view of a hollow wall in which bricks or blocks of the same character are employed; and

Fig. 6 is a fragmentary front elevation of the same.

In order to answer all practical requirements interlocking units for the construction of walls should be adapted to interlock both in a longitudinal and a transversal sense. Furthermore, when interlocking in a transversal sense, the side of one unit should remain flush with the head of the unit or units interlocking therewith so that perfectly square corners and even surfaces are obtained at all times. The interlocking action takes place between units which are superimposed or partly superimposed on one another and is obtained by virtue of projections provided upon one of the surfaces of one unit registering and interlocking with depressions provided in the abutting surface of an adjoining unit in a vertical sense, said projections and depressions being so positioned in relation to one another that the units will automatically assume a relative position insuring continuity of the bond between units throughout the entire wall, at the same time causing clearance spaces to be left between the vertical surfaces of adjoining units in a horizontal sense in order to provide room for the necessary mortar. Mortar is also employed, of course, between adjoining horizontal layers and therefore suitable provisions are also made in order to allow the necessary clearance space; this can be obtained either by making the projections on one unit a little larger than the depressions in the adjoining superimposed unit, so that the surfaces of said units are prevented from coming into actual contact with one another, or else by making the projections on one unit small enough in relation to the depressions in the adjoining interlocking unit to allow for a clearance space all around between the surfaces of said projections and said depressions.

In this case, after a horizontal layer of units has been laid in position, a layer of mortar is spread all over its surface, and a new layer of units is then set in place without breaking the continuity of the layer of mortar; said layer of mortar following the irregular outlines of the units.

I prefer to follow a midway course between these two extremes by making the projections exactly of the same size as the depressions, so that a positive interlocking action in a lateral sense is obtained even if no mortar is used between adjoining horizontal layers; since by making the projections and depressions with a tapering outline, this also makes it possible to obtain continuity of a layer of mortar spread between adjoining horizontal layers except that the spaces between the sides of the depressions and projections interlocking therewith will be somewhat smaller than the space between adjoining horizontal surfaces.

In order to obtain the proper position of the various units when a wall is constructed, I make the length and width of each unit interdependent in order to make the proper allowance for the mortar space; and while various forms of interlocking means may be used, I also make interdependent the relative positions assumed by said interlocking means for the purpose of both longitudinal and transversal binding action.

The invention will be better understood by referring to the annexed drawings, illustrating bricks in which the interlocking action is obtained by means of ridges and corresponding depressions forming a male and female joint.

Referring to Figs. 1 and 2, it is seen that the brick or block 24 has its upper surface formed with a central longitudinal ridge 25 crossed by two transversal ridges 26, 27, and its lower surface formed with corresponding depressions or grooves 28, 29, 30 adapted to register with the ridges of a similar underlying brick or block.

The width and length of the brick, and the distance between the transversal ridges and depressions and the ends of the brick are interdependent and in a definite relation to each other, being calculated and positioned so that when a wall is built suitable interstices will be left between adjoining surfaces to provide for an adequate thickness of mortar between brick and brick or block and block. For instance, if a, desig-

nates the thickness of the mortar, the length of the brick *b*, is equal to twice its width *c*, plus *a*; and the distance *d*, between the transversal ridges and depressions and the end of the brick nearest thereto, is equivalent to one-half of *c*.

Due to this construction, adjoining elements may be caused to interlock in any desired manner leaving a suitable space all over for a layer of mortar between adjoining elements. Thus, if a layer of bricks is laid with the bricks arranged end to end as shown in 44, 45, 46, and a similar layer 32, 33, 34 etc., is laid on top of the same, with its elements in a staggered relation to the others, the elements will interlock leaving spaces as at 35 for the mortar. If the wall thus built is of a thickness corresponding to two longitudinal rows of bricks, as shown in Fig. 6, occasionally two side adjoining longitudinal bricks may be omitted and in their stead two transversal bricks may be used as shown as at 36, 37; in this case, these transversal bricks act as binders between the two longitudinal rows of bricks of which the wall is constituted, interlocking with the bricks of both rows, still leaving a space as at 38 for the mortar between the two longitudinal rows.

The wall thus obtained is therefore very solid because its elements are interlocking with one another in all directions.

By using bricks or blocks of special length, it is also possible to build hollow walls as shown in Figs. 8 and 9, where the two longitudinal rows of bricks or blocks 39, 40 are separated by a space 41 and are connected by transversely arranged bricks or blocks 42, 43, the length of which is equivalent to the width of the two rows plus the width of the intervening space, said transversal members being also provided with ridges and depressions adapted to interlock with the ridges and depressions of the elements used in the construction of the wall proper.

A building thus constructed is quite as strong as if its walls were built solid throughout; and furthermore its sanitary and heat retaining properties are improved and its cost is much less than if solid walls were employed.

In the example illustrated, the ridges and the depressions are of a corresponding size, so that an interlocking action may be obtained whether mortar is used or not as previously explained.

The units employed in my improved wall construction may be either bricks or building blocks made of a suitable cement composition, concrete or other suitable materials. It is obvious that a wall thus constructed is considerably strengthened in a lateral sense and is not easily disrupted by earthquake shocks or by the disentegrating effects of heat, due to the positive bond established between the various units of which the wall is composed. This type of building unit also considerably simplifies the construction of hollow walls, doing away with the necessity of using separate metal parts or binders, in order to hold the two spaced sections of a wall together.

The positioning of the transversal binding means in relation to the end surface of a unit to correspond to the positioning of the longitudinal binding means in relation to the side surfaces is a novel feature, which is mainly responsible for the adaptability of the unit described for all purposes of building construction; this feature together with the relation existing between the width and length of each unit being also responsible for the superior results obtainable in building walls which are both interlocking throughout and solidified by the use of a suitable quantity of mortar between adjoining units.

It is, of course, possible to modify my invention to a certain extent without departing from the inventive idea, and therefore the drawings are to be considered as intended for illustrative purposes only and not in a limiting sense.

Accordingly, I reserve myself the right to carry my invention into practice in all those ways and manners which may enter fairly into the scope of the appended claims.

I claim:

1. A building unit of the character described, having a substantially rectangular outline with top and bottom surfaces, having a length equal to twice its width plus a predetermined quantity equivalent to the thickness of mortar interposed between adjoining units, one of said surfaces being provided with projections and the other with corresponding depressions, permitting interlocking of one unit with another when superimposed thereon so as to totally cover its surface and also permitting interlocking of one end of one unit with one end of another when partly superimposed thereon, in a longitudinal sense, the end surface of each unit limiting the interlocking section, remaining at a distance equal to the width of each unit from the end surface of the other.

2. A building unit of the character described, having a substantially rectangular outline with top and bottom surfaces, having a length equal to twice its width plus a predetermined quantity equivalent to the thickness of mortar interposed between adjoining units, one of said surfaces being provided with projections and the other with corresponding depressions, permitting interlocking of one end of one unit with one end to another, partly superimposed thereon in a longitudinal sense, the end surface of each unit limiting the interlocking section remaining at a distance equal to the width of each

unit from the end surface of the other, and permitting interlocking of one end of one unit with one end of another partly superimposed thereon in a transversal sense, the end surface of each unit being in alignment with a side surface of the other in the interlocking section.

3. A building unit of the character described, having a substantially rectangular outline with top and bottom surfaces, having a length equal to twice its width plus a predetermined quantity equivalent to the thickness of mortar interposed between adjoining units, one of said surfaces being provided with projections and the other with corresponding depressions, permitting interlocking of one unit with another, when superimposed thereon so as to totally cover its surface, and also permitting interlocking of one end of one unit with one end of another when partly superimposed thereon in a longitudinal sense, the end surface of each unit in the interlocking section remaining at a distance equal to the width of each unit from the end surface of the other, and furthermore permitting interlocking of one end of one unit with one end of another partly superimposed thereon in a transversal sense, the end surface of each unit being in alignment with a side surface of the other in the interlocking section.

4. A building unit of the class described, having a substantially rectangular outline with top and bottom surfaces, having a length equal to twice its width plus a predetermined quantity, one of said surfaces being provided with a central longitudinal ridge and two transversal ridges, each located at a distance equivalent to one half the width of said unit, from one of the ends of said unit and the other surface being provided with corresponding depressions permitting interlocking of a plurality of units when arranged in abutting relation to one another.

5. A building unit of the class described, having a substantially rectangular outline with top and bottom surfaces, having a length equal to twice its width plus a predetermined quantity, one of said surfaces being provided with a central longitudinal ridge and two transversal ridges, having an outline corresponding to that of said longitudinal ridge, each located at a distance equivalent to one half the width of said unit, from one of the ends of said unit, and the other surface being provided with corresponding depressions, permitting interlocking of one unit with another arranged in abutting relation thereto, both in a longitudinal and a transversal sense.

6. A building unit of the character described, having a substantially rectangular outline with top and bottom surfaces having a length equal to twice its width plus a predetermined quantity equivalent to the thickness of mortar interposed between adjoining units, one of said surfaces being provided with projections and the other with corresponding depressions permitting interlocking of each end of said unit with one end of each of two additional similar units superimposed thereon, arranged in abutting relation thereto, either in a longitudinal or a transversal sense, leaving a clearance space equal to the said predetermined quantity between the side surfaces of said two additional units facing each other midway of said unit transversely thereof.

7. A wall comprising a plurality of superimposed horizontal layers of building units longitudinally arranged in a row in each layer, the units of one layer being in a staggered relation to the units of another superimposed layer, each unit having a substantially rectangular outline with top and bottom surfaces of a length equal to twice its width plus a predetermined quantity, one of said surfaces being provided with a central longitudinal ridge and two transversal ridges each located at a distance equivalent to one half the width of said unit from one of the ends of said unit and the other surface being provided with corresponding depressions so that the various units will interlock with one another leaving clearance spaces between the vertical end surfaces of adjoining units and a filling of binding material within said spaces.

8. A wall consisting of two parallel sections at a distance from one another, forming a hollow wall structure, each section comprising a plurality of superimposed horizontal layers of building units longitudinally arranged in a row in each layer, the units of one layer being in a staggered relation to the units of another superimposed layer, each unit having a substantially rectangular outline with top and bottom surfaces and having a length equal to twice its width plus a predetermined quantity, one of said surfaces being provided with a central longitudinal ridge and two transversal ridges each located at a distance equivalent to one half the width of said unit from one of the ends of said article and the other surface being provided with corresponding depressions so that the various units will interlock with one another leaving clearance spaces between the vertical end surfaces of adjoining units, a filling of binding material within said spaces, and transversely arranged connecting units, interlocking with units of both sections to provide a binding action therebetween.

9. In a wall or building construction, a plurality of building units of substantially rectangular outline, each unit having means on the top and bottom surfaces at both sides of the center line thereof, whereby the units of one course may interlock with companion

units of another course, the said means of one unit being spaced from the center line of said unit a distance equal to the distance of the corresponding means of a companion unit from the adjacent end surface of said companion unit plus a distance equal to one-half the thickness of the mortar joint between units in the same course, permitting interlocking of a plurality of units in superimposed relation with mortar joints of the same predetermined thickness.

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