July 8, 1930. J. R. McPHERSON 1,770,082

BUILDING UNIT

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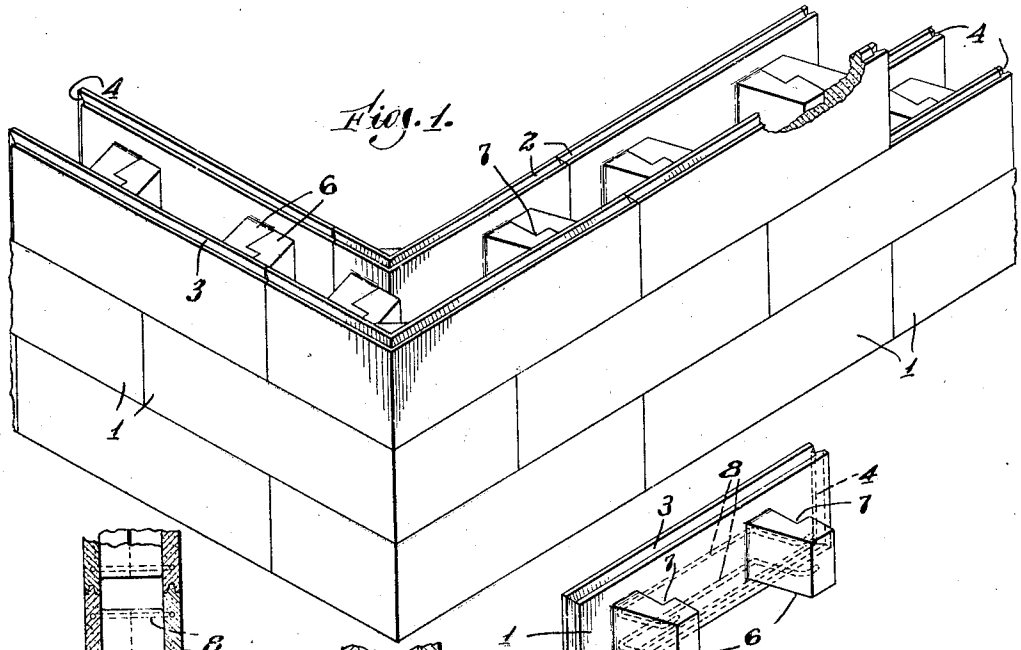


Fig. 1.

Fig. 4.

Fig. 2.

Fig. 3.

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Fig. 5.

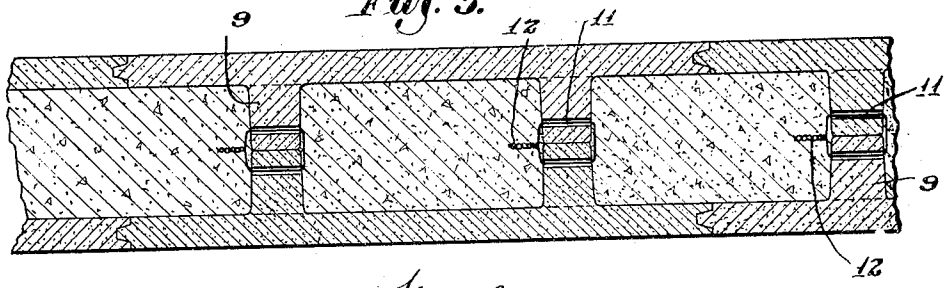


Fig. 6.

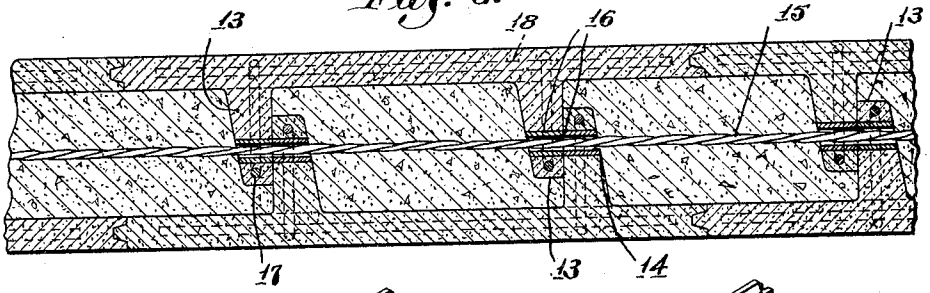
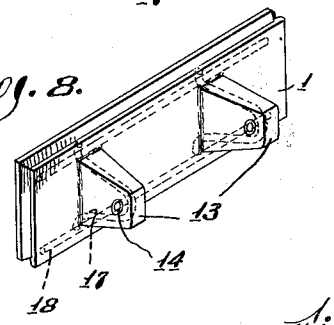


Fig. 8.



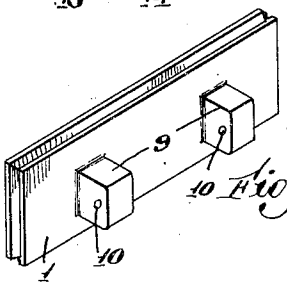


Fig. 7.

Fig. 9.

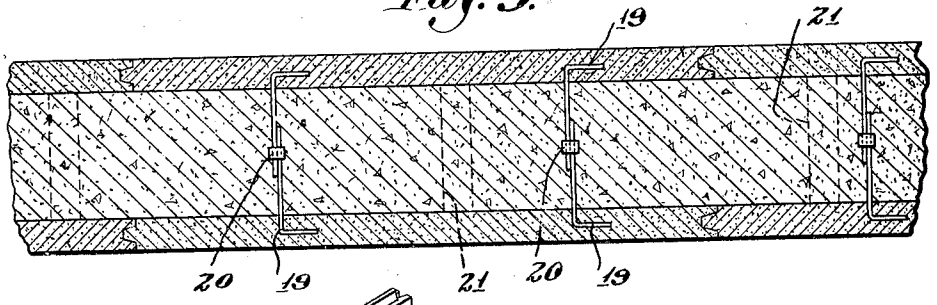
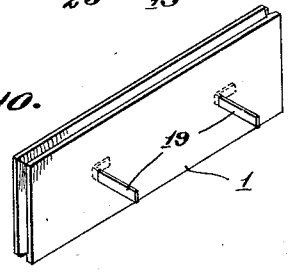


Fig. 10.



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UNITED STATES PATENT OFFICE

JOHN R. McPHERSON, OF JAMAICA PLAIN, MASSACHUSETTS

BUILDING UNIT

Application filed June 29, 1929. Serial No. 374,750.

In structural concrete work, it has long been the aim of builders to eliminate the usual lumber shell or form into which the concrete is first poured and which is afterwards stripped away from the concrete when the concrete has set. Aside from the matter of lumber cost itself and the time involved, the labor charges for erecting and removing such form or shell is a very considerable item in the total cost of the work.

My invention involves a pre-cast building unit which is characterized by certain novel features both as regards the construction of the units themselves and the method of assembling the same in spaced parallel interlocked courses.

In accordance with my general concept, my pre-cast units are each constructed with interlocking or inter-engaging abutments which when a double course of such units is laid constitute elements performing the double function of ties for retaining the courses against collapse while the units are being laid and of spreaders for preventing the units from expanding outwardly under the pressure of the concrete filling after the courses have been laid and the concrete filling poured between the units, thus avoiding the necessity of providing independent ties and spreaders which must be separately placed in position and assembled before the concrete is poured.

The units may be further reinforced both longitudinally and transversely by metallic reinforcing elements embedded longitudinally therein and in the offset abutment lugs, and such longitudinal and transverse reinforcing elements may be either a single length of metal embedded in the units longitudinally thereof and bent at its ends to extend through the lugs, or the lug reinforcements may be separate from the longitudinal reinforcements.

In addition, the opposing units of the double course of units may if desired be continuously tied together by longitudinal ties independent of and additional to the reinforcements of the units themselves.

In the accompanying drawings, I have shown several forms of pre-cast units constructed and assembled in accordance with the principles of my invention.

In such drawings:—

Fig. 1 is a fragmentary perspective view of a wall constructed with one form of pre-cast unit in accordance with my present invention, and particularly showing the interlocking relation of such units.

Fig. 2 is a horizontal section through such wall.

Fig. 3 is a vertical section showing a combination foundation and wall construction built with such units.

Fig. 4 is a detail perspective view of one of the units shown in Figs. 1 to 3.

Fig. 5 is a fragmentary horizontal section through a wall built with a slightly different form of pre-cast unit.

Fig. 6 is a view similar to Fig. 5 but showing a still further modification of the unit structure.

Fig. 7 is a detail perspective view of one of the units shown in Fig. 5.

Fig. 8 is a similar view of one of the units shown in Fig. 6.

Fig. 9 is a view similar to Figs. 5 and 6 but showing a further modification of unit structure, and

Fig. 10 is a view similar to Figs. 7 and 8 of one of the units shown in Fig. 9.

My pre-cast units are molded of concrete by methods and apparatus described and claimed in my companion application for patent and when formed present smooth finished inside and outside surfaces. The units are duplicates, and may therefore be interchangeably used regardless of location, i. e., whether in the inner or the outer courses of the wall, in foundation or aboveground courses, or in stretches or at corners.

Referring first to the construction shown in Figs. 1 to 4 inclusive, each unit consists of a slab 1 of molded concrete, preferably generally rectangular in form and relatively narrow in thickness. As such it presents opposite longitudinal edges 2 and 3, which are respectively tongued and grooved as shown in Fig. 4, and end edges 4 and 5 which are similarly tongued and grooved as shown in Figs. 2 and 4.

Intermediate of its edges, said slab is formed on its inner face with one or more offset abutments which functionally act as combination ties and spreaders and structurally may conveniently take the form of horizontally projecting lugs 6 cast integral with the slab 1.

As here shown, each unit 1 is provided with a pair of symmetrically spaced lugs 6 and each lug is formed with an undercut locking shoulder 7 on one of its transverse faces.

If desired, the slab as a whole and the lugs 6 individually may be longitudinally and transverely reinforced as best indicated in Figs. 2 and 4. Structurally such reinforcement may be a pair of spaced reinforcing wires 8 embedded in the slab 1 longitudinally thereof. These wires are inset sufficiently from the longitudinal edges of the slab to intersect the bases of the lugs 6, where they are bent upon themselves and extended outwardly through the lugs, thus to reinforce the same.

In constructing a wall with such units, the units are laid in spaced parallel inner and outer courses with the shoulders 7 of the lugs of opposing units in the two courses interlocked with each other across the space separating the courses, as clearly shown in Fig. 2, and with the tongue and grooved edges of the units in each course interlocked with adjacent units in the same course both endwise and at top and bottom.

The units of the same course are thus interlocked with each other and with opposing units in the opposite course without the necessity of employing any separate ties or spreaders, the lugs 6 themselves serving as spreaders while the courses are being laid to hold the slabs properly spaced apart from each other and as ties after the concrete or other cementitious filling C is deposited between the courses to prevent the courses from buckling outwardly under the internal pressure of the filling. When thus assembled, the units are bonded together as a homogeneous whole by the filling C.

If desired, however, the filling C may be omitted in which event the interlocking action alone of the lugs will hold the units in proper assembly, and the spaces between the lugs of opposite units in the double course will constitute spaces for air circulation. This is shown in Fig. 3, wherein a combination foundation and wall structure is illustrated, that part of the wall below the ground level being indicated as solidly filled with concrete or the like C and that part above the ground being indicated as unfilled.

In the form of my invention shown in Figs. 5 and 7, the units 1 are formed with horizontal lugs 9 which are longitudinally pierced as at 10. When a double course of these units is laid, the lugs of opposing units in the courses abut each other endwise, as shown in Fig. 5, and are secured together by ties 11 which may be simple wires looped through the holes 10 of abutting lugs and twisted upon themselves as indicated at 12.

In the form of my invention shown in Figs. 6 and 8, the units 1 are formed with spaced horizontal lugs 13 which are longitudinally pierced by alined holes 14. In this form, the lugs of opposing units in the double course overlap each other laterally, as shown in Fig. 6 when the course is laid, and the entire assembly is secured together by longitudinal tie wires 15 which are passed continuously through the registering holes 14 of the opposing lugs. These holes may be lined with metal or other bushings 16 embedded therein during the process of moulding the units 1.

In this form of my invention, I have also shown longitudinal and transverse reinforcements for the units and lugs which are generally similar to those shown in Figs. 1 to 4 but with this difference, that the transverse reinforcements 17 embedded in the lugs 13 are separate from the longitudinal reinforcements 18 embedded in the slabs proper, the reinforcements 17 being in fact substantially U-shaped wires having their open ends bent around the longitudinal reinforcements 18 as best shown in Fig. 8.

In the form of my invention shown in Figs. 9 and 10, the units 1 are provided with spaced horizontal metallic lugs 19 cast therein during the process of moulding the units. As in the form shown in Figs. 6 and 8, the lugs of opposing units in the double course overlap each other when the course is laid, and are secured together by metallic clips 20 bent therearound. The lugs 19 in this form of my invention serve only as ties, and separate spreaders 21 are necessary.

In all these several forms, all edges of all units are tongued and grooved as in the form shown in Figs. 1 to 4.

Various other modifications in construction and method of assembly may obviously be resorted to within the spirit and scope of my invention as defined by the appended claims.

What I therefore claim and desire to secure by Letters Patent is:

1. In building construction, a wall comprising spaced parallel courses of pre-cast building units, each unit consisting of a relatively thin elongated slab of generally rectangular form having a lug projecting horizontally therefrom at substantially right angles to the plane of the unit, and the lugs of the units in one course engaging those of the opposite units in the other course in direct interlocked relation across the space separating said courses, all side portions of each lug being disposed in spaced relation to all of the side edges of the slab from which the lug projects.

2. In building construction, a wall comprising spaced parallel courses of pre-cast

building units, each unit consisting of a relatively thin elongated slab of generally rectangular form having a lug projecting horizontally therefrom at substantially right angles to the plane of the unit, said lug having a lateral extension providing a shoulder disposed in spaced relation to the slab and substantially parallel to the plane thereof for direct interlocking cooperation with the shoulder of the corresponding lug of an opposite slab for holding the slabs of the two courses of units against separation relative to one another.

3. A building unit, consisting of a relatively thin elongated slab of generally rectangular form, and a combination tie and spreader lug projecting horizontally from said slab at substantially right angles thereto, said lug having a lateral extension providing a shoulder disposed in spaced relation to the slab and substantially parallel to the plane thereof for direct interlocking engagement with a similar shoulder on the lug of an opposite unit.

4. A building unit consisting of a relatively thin elongated slab having a combination tie and spreader lug projecting horizontally therefrom at right angles to the plane of the slab and adapted to overlap a similar lug projecting from an opposite unit when the units are laid in spaced parallel courses, said lug having a shoulder disposed substantially parallel to the plane of the slab for direct interlocking engagement with a similar shoulder on the lug of an opposite unit.

In testimony whereof I affix my signature.

JOHN R. McPHERSON.