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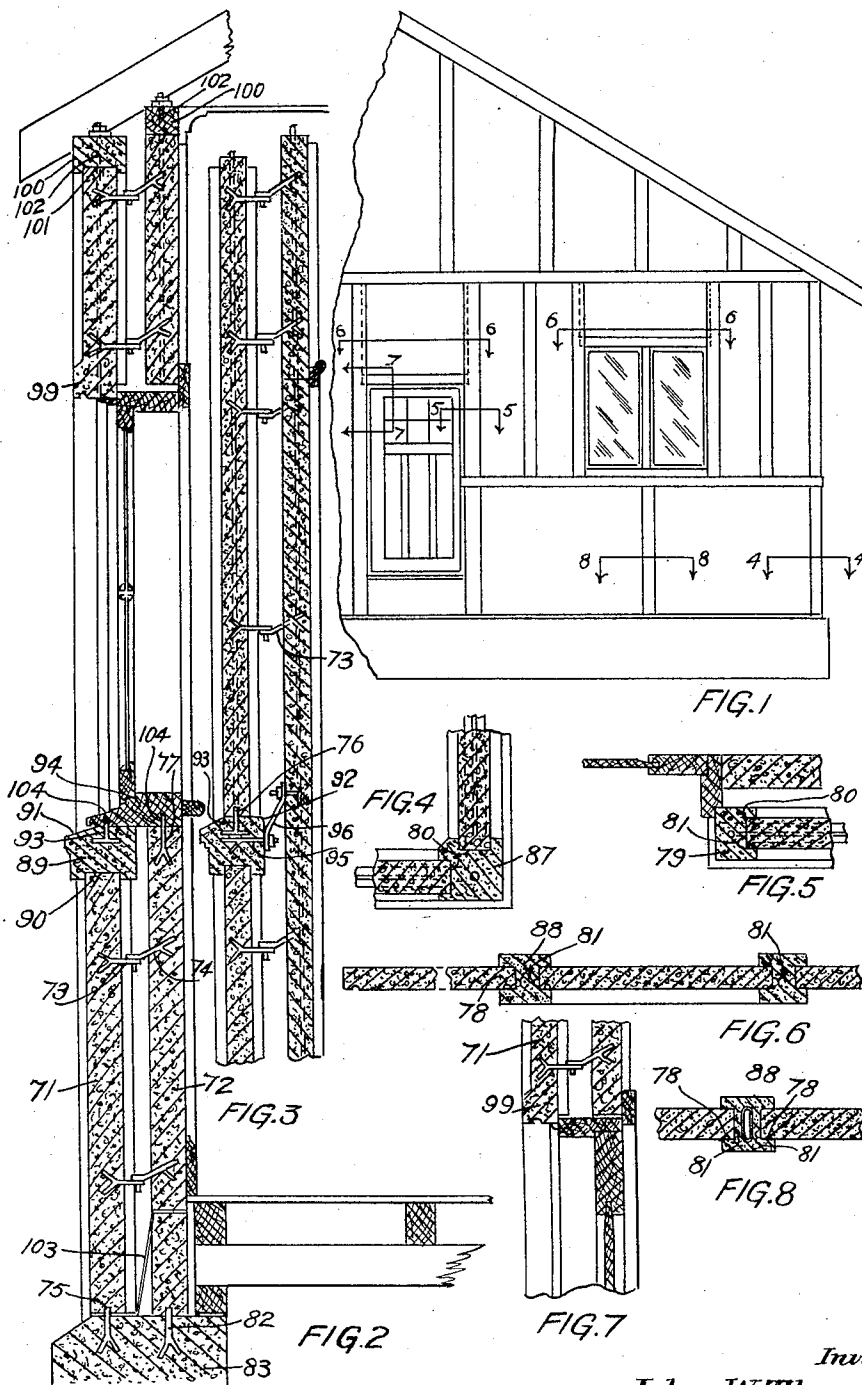
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CONCRETE BUILDING CONSTRUCTION

Filed Dec. 5, 1925

2 Sheets-Sheet 1



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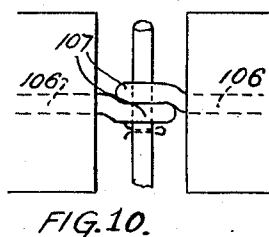
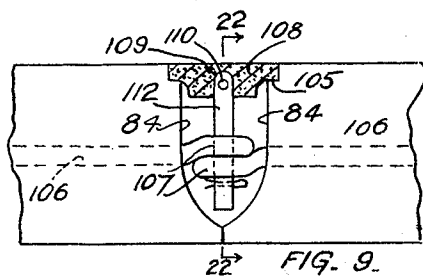


FIG. 11.

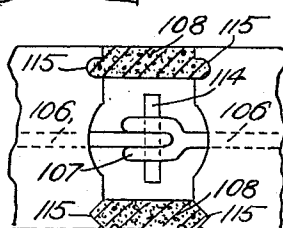
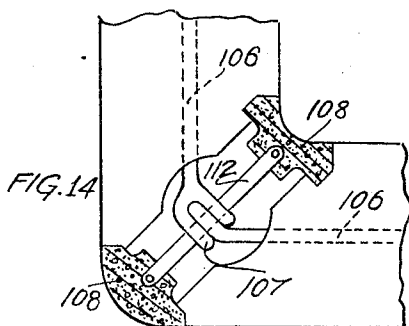
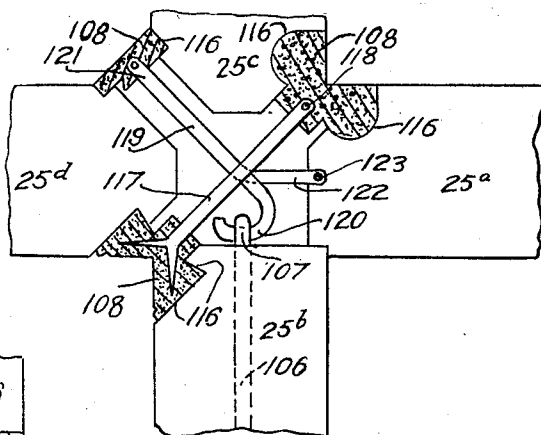
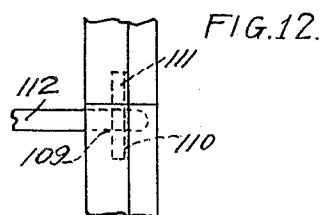
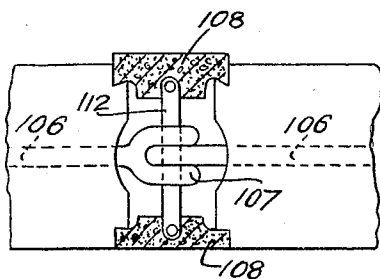


FIG. 13.

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UNITED STATES PATENT OFFICE

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CONCRETE BUILDING CONSTRUCTION

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This invention relates to the construction of buildings with precast slabs and the improvements have been specially devised in order to enable the erection of effective and durable concrete structures with precast slabs thus dispensing with the use of moulds or forms and eliminating the expense thereof and of their handling and much skilled labor thus reducing the cost and whereby buildings, with outer dual walls having a cavity therebetween or with distanced walls filled in situ to form a solid wall, may be expeditiously erected.

According to this invention in addition to the combination and arrangement of and the parts hereinafter described, one of the principal features is that slabs of concrete or of any other suitable or convenient materials made in any manner to any convenient size or sizes and dimensions and having either or both the obverse and reverse plain or patterned and/or ornamented as desired, have, for cavity walls, embedded therein where necessary and/or desirable and projecting from the reverse, coacting eye members and hook members so that during the erection of the slabs constituting the outer and inner parallel walls of cavity walls such members will engage and so lock the distanced parallel slabs together, such members of the outer slabs each preferably being disposed or having its projecting end bent to an inclined angle from the reverse of its slabs, and/or, such members of the inner slabs each being disposed at or having its projecting end bent to an inclined angle to the reverse of its slab so that the connected members will be at an inwardly inclined angle and so prevent any moisture which may pass through the outer wall from reaching the inner wall and which arrangement obviates the defect of semi-cavity constructions as hitherto which have obtained rigidity by filling up a portion of the cavity, and thus defeating the purpose of a complete cavity.

Modified slabs and connecting and inter-fitting and connecting means are provided for erection and locking together of dual walls, and single walls, and for forming moulds or supports in or upon which solid walls, columns and ceilings are to be cast in situ, precast slabs are provided having inter-fitting features so that the slabs when erected in required positions or formations may be locked together as hereinafter described.

From the following descriptions and illustrations it will be seen that for cavity wall construction a complete or continuous cavity is provided. Damp courses and built in flashing are also provided.

In order that the improvements and the applications thereof will be readily understood the same will be described with reference to the accompanying drawings in which:—

Figure 1 is a front elevation of part of a building erected according to some of the present improvements.

Figures 2 and 3 are vertical sectional elevations of a cavity wall, where there is a window opening, and where there is no such opening respectively.

Figure 4 is a sectional plan on the line 4—4 in Figure 1,

Figure 5 is a sectional plan on the line 5—5 in Figure 1,

Figure 6 is a sectional plane on the lines 6—6 (above the door and above the window) in Figure 1, but with the co-acting members omitted.

Figure 7 is a vertical sectional elevation on the line 7—7 in Figure 1 in the direction of the arrow.

Figure 8 is a sectional plan on the line 8—8 in Figure 1.

Figures 9, 11 and 13 are partial sectional plans showing modified vertically butted slabs with interlocking means.

Figure 10 is a fragmentary sectional plan showing the interlocking means of Figure 9 oppositely arranged.

Figure 12 is a fragmentary sectional elevation on the line 12—12, Figure 9.

Figure 14 is a partial sectional plan showing vertically and diagonally butted slabs.

Figure 15 is a similar view of slabs of intersecting walls and interlocking means therefor.

For the erection of cavity walls the outer slabs 71 and inner slabs 72 for external walls are cast with coacting members embedded

therein and projecting from the reverse, one of such members being a gudgeon 73 and the other 74 being an engaging or hook member to enter the gudgeon eye, the gudgeons being in bottom and top outer slabs but in intermediate inner slabs and the hook members being in top and bottom inner slabs but in top outer slabs, both the gudgeon and the hook member being embedded in the inner slabs at a declined angle but with the free projecting end about horizontal to prevent any moisture from the outer wall reaching the inner wall, and in the bottom of said slabs are dowel sockets 75 or a longitudinal channel 76 (Fig. 3) and where required embedded and projecting dowels 77. In addition, when desired the external slabs may have a longitudinal concavity or weather channel 78 in the obverse just inwardly from each side edge and if desired in the top edge just inwardly from the obverse.

Door and window studs 79 (Fig. 5) in bottom and top sections to form the side face of a door or window opening are of any cross sectional shape but preferably about rectangular on three faces and in the fourth face have a longitudinal slab channel 80 for reception of the side edge of adjacent wall slab 71 such recess preferably having a longitudinal concavity or weather channel 81 at the side of said recess nearest the weather face of the stud so that any moisture finding its way in past the channel 78 and around the inserted edge of said slab 71 will drain away down said channel 81 and escape from the outside of the weather bar 93 in the sill moulding 89. In the bottom end of said studs are sockets for entry or upstanding dowels 82 either in foundation blocks 83 or in or through a sill mold, and in the top ends there may be sockets to receive a dowel or there may be embedded and projecting dowels or bolts to enter sockets or pass through holes in a sill mould and in a top plate and to enter sockets in a window sill.

Corner studs 87 (Fig. 4) are somewhat rectangular in cross section and have in two adjacent faces the slab channel 80 each with the weather channel 81 for reception of the side edges of intersecting slabs and are arranged as in Figure 4 for external corners of external walls and for the junction of external walls in a recess corner the stud is reversed end to end.

Intermediate studs 88 have in each of two opposite longitudinal faces the slab channel 80 each with weather channel 81.

Sill molding 89 which is erected along the whole of outer walls at desired height is in requisite lengths and of somewhat rectangular cross section with the outer face suitably configured as desired for appearance, has in the lower side for reception of the top edge of wall slabs, a longitudinal channel 90, a plain flat back or inner face, and in the top,

which is flat in the centre with a wide chamfer 91 at the outer edge, and if desired with a narrow chamfer 92 at the inner edge, has a longitudinal weather plate 93 embedded to project above said flat to enter the longitudinal channel 76 in the bottom edges of upper wall slabs and in a like channel in wooden window sills 94, and where required has embeddedly anchored therein tie bolts 95 with their screwed ends projecting from the reverse for the bolting thereto of the lower ends of angled tie members 96 whose other and upper ends are bolted to like tie bolts 95 projecting from the reverse of the inner slabs 72.

External slabs 71 to be positioned above a door or window may have a weather projection 99 formed along the bottom of the obverse and which is checked back at each end to permit the side edge of the slab to enter the channel 80 of the studs.

Top plates 100 may be of concrete or of ordinary timber of rectangular cross section may have a channel 101 in the bottom edge or may be bored at requisite positions for passage of the screwed projecting ends of bars or bolts 102 which are embedded in, or grouted into sockets in, the top wall slabs and or in the top ends of the studs.

In erecting a building with cavity walls the whole foundation is laid in the ordinary manner, damp course material 103 is laid with one longitudinal edge upon the top of said foundation 83 and thereon are placed requisite corner studs 87, intermediate studs 88 and door studs 79 to sill height, when bottom outer wall slabs 71 are positioned between them to enter their channels 80 and rest on the foundation right around the building and upon the top of the whole the sill molding 89 which has the channel 90 to receive their top edges, and vertical bores at requisite positions, and is complementarily halved to overlap at intersecting ends and thereat has the weather plate 93 projecting and the web removed and the flat bored and slightly bent so as to overlap, is positioned with the dowels projecting from the tops of said studs passing through said bores and projecting above said molding so that the whole are held together thus completing the whole of the outside walls to "sill" height. Tie members 96 are then bolted at their lower ends on to the projecting bolts 95 of the sill molding leaving their other ends distanced therefrom and upstanding. A lower course of internal wall slabs 72 having sockets in the bottom are then placed upon the foundation and the upstanding dowels 82 thereof enter said sockets and hold the slabs in position. Upon the top of said slabs 72 is laid the free inner edge of the damp course material 103 and thereupon are erected further slabs 72 of the inside wall, the hook members 74 of such slabs engaging the gudgeon mem-

bers 73 of the outer slabs 71 as the former are placed in position, whereafter the inner ends of the tie members 96 are bolted to the projecting ends of the tie bolts 95 of said inner slabs 72 the erection of which slabs is continued up to "door head" height their projecting gudgeon members 73 then being ready to receive hook members 74 of the outer slabs when erected. The erection of outer slabs is then continued up to top plate height by studs positioned upon the sill molding and slabs therebetween, the channel in the bottom of such slabs fitting upon the weather plate 93 in the molding 89; all of the slabs being secured to the inner wall slabs by the hook members 74 of the outer slabs 71 engaging in the gudgeon members 73 of the inner slabs 72. A top plate 100 which preferably has channel 101 for outer wall and is requisitely bored is then laid upon the top of the slabs and studs of the outer wall and fitting upon the upstanding bolts 102 is secured by nuts and the outer wall is completed. The top of the inner wall is then completed by erecting a course of slabs which have hook members 74 projecting therefrom to engage in the gudgeon members 73 projecting from the top portion of the slabs of the outer wall, and a similar top plate is affixed as described. The horizontal courses of slabs in the outside walls being erected with horizontal molding ensures horizontal or longitudinal rigidity and the slabs of outer and inner walls being erected with the horizontal joint at different planes provides vertical rigidity and such slabs being laid alternately in opposite walls so that the upstanding slab in say the inner wall is tied to the lower slab in the outer wall support for the next course laid on said outer wall is provided.

The usual wooden window sills 94 which have a longitudinal channel 104 in the bottom near the outer edge and at the inner edge have a like channel 104 or in place thereof a plurality of sockets, fit onto the sill molding over the upstanding weather plate 93 thereof and over a like plate or upstanding dowels 77 which are embedded in the inside wall slabs and project from the top edges thereof.

The dowels projecting from the top of the bottom course corner studs and the bottom course door posts will be long enough to pass through bores in the sill mold to form dowels to enter the bottom ends of upper courses of said posts which rest on said mold.

In slightly modified vertical connections of slabs (Figs. 9 to 15) each side edge of the slab has a recess 84 shaped as shown with a shoulder 105 the projecting eyed ends 107 of the embedded rods 106 are set alternately to opposite sides so that such eyed ends of juxtaposed slabs will overlap and interlock, and inset or creasing slab 108 having a recess 109 and a dowel socket 110 in each end and its side edges suitably shaped is then inserted be-

tween the slabs and seats in the shoulders 105 of the wall slabs and a locking bar 112 with orificed ends is then pushed through the coincident eyed ends 107 of juxtaposed slabs, the outer end thereof is then secured in the recess 109 of the slab 108 by a dowel 111 driven through said bar into the socket 110 thus locking the juxtaposed slabs together and drawing and holding the inset slab 108 tight within the shoulders 105 of the recesses 84 of said slabs, said dowels 111 being long enough to upwardly project to enter the socket in the bottom end of the next inset slab when erected.

In Figure 11 is shown an arrangement in which an inset slab is used at both sides of the joint, Figure 14 illustrating the same joint but at a corner, and Figure 13 showing an arrangement in which the overlapped eyed ends 107 of the slab rods 106 are secured by a pin 114 and the shoulders 105 of the slabs are recessed to receive complementary laterally projecting edges 115 of the inset slabs 108 which slabs are slid into position after the wall slabs have been erected and locked together.

If desired the inset slabs may be made with a dovetail or enlarged side edges and the ends of the wall slabs would be complementarily vertically slotted so that by sliding an inset slab down between the ends of two slabs said slabs will be locked together.

In Figure 15 are illustrated slabs for and means of connecting them at intersections the slab ends having vertical recesses 116 to receive the inset slabs 108 which are erected in vertical sections and may have a dowel socket in each end and where required a recess 109 about such socket, and the slabs in one wall also have in the upper edge near the side edge a recess 109, and a dowel socket 110 therein and the slabs in a wall at right angles to such other wall have embedded rods 106 with eyed ends 107 projecting from its end edge at requisite positions, and the inset slabs 108 for one position have embedded and projecting connecting bars 117 with orificed or eyed ends 118.

The slabs are erected as shown and the inset sections between 25^d and 25^b are inserted and their projecting connecting rods are secured by a dowel in the top of the inset sections between 25^c and 25^a, the space between 25^d and 25^d permitting entrance of the hand or a tool to effect the fixture and the connecting bar 119 which has at one end a hook 120 and the other end 121 orificed has an offshoot 122 with orificed end 123 has the hooked end 120 passed through an eye 107 of the slab 25^b, the offshoot 122 pinned by a dowel to the slab 25^a and thereafter the inset section is erected between 25^d and 25^c and locked in position by a dowel driven thereinto through the end 121 of the connecting bar 119.

The use of the inset slabs in the jointing of

wall slabs allows the connection of the reinforcing rods to be done readily and thoroughly effected and the mortar to be inserted compactly as the inset sections are fitted.

I claim:—

5 1. In a building construction, a plurality of slab sections arranged in edge-to-edge relation but spaced from each other, a plurality of insert slabs having engagement with said spaced slab sections and providing an interfitting connection therebetween, and locking means arranged between the sections.

10 2. In a building construction a plurality of slab sections arranged in edge-to-edge relation but spaced from each other, a plurality of insert slabs having engagement with said spaced slabs and providing an interfitting connection therebetween and locking means arranged between the sections and the insert slabs.

15 3. In a building construction, a plurality of sections arranged in edge-to-edge relation but spaced from each other, insert slabs having engagement with the opposed edges of said spaced sections and forming an interfitting connection there between and anchoring means arranged between the insert slabs and between said sections.

20 4. In a building construction, a plurality of slab sections arranged at various angles to each other and being spaced from each other, a plurality of insert slabs having engagement with said spaced slab sections and forming an interfitting connection therebetween, and an interlocking connection between the insert slabs and the slab sections.

25 5. In a building construction, spaced sections, insert slabs having engagement with said spaced sections and forming an interfitting connection therebetween, a locking bar secured to said insert slabs and extending between said spaced sections, and rods embedded in the sections and having detachable engagement with said extending bar.

30 6. In a building construction, spaced sections, insert slabs between the spaced sections and positioned upon the opposed edges of said sections, one having an interlocking engagement with the sections, the other an abutting engagement with the sections, a locking bar connecting the opposed insert slabs together and tie rods embedded in said sections and engaging said bar.

35 7. In a building construction, a plurality of inner and outer slab sections forming an inner and outer wall, the slabs of said walls being arranged in edge-to-edge relation but spaced from each other, a plurality of insert slabs having engagement with said spaced slab sections and forming an interfitting connection therebetween, interlocking means fixed to said insert slabs and to said spaced slab sections, and means secured to said slab sections and providing a connection between

said inner and outer wall formed by said slab sections.

8. In a building construction, a plurality of inner and outer slab sections forming an inner and outer wall, the slabs of said walls being arranged in edge-to-edge relation but spaced from each other, a plurality of insert slabs having engagement with said spaced slab sections and forming an interfitting connection therebetween, a bar fixed to said insert slabs, tie rods embedded in said slab sections and engaging said bar, and means secured to said slab sections and providing a connection between said inner and outer wall formed by said slab sections.

Dated this third day of November, one thousand nine hundred and twenty-five.

JOHN WILLIAM THOMPSON.