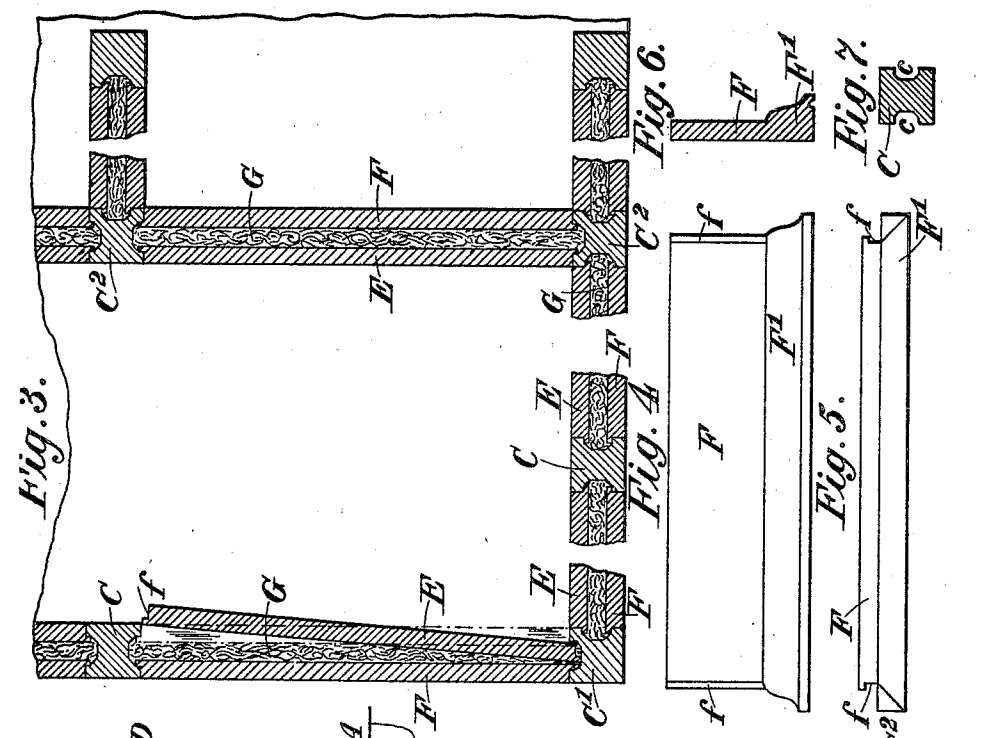
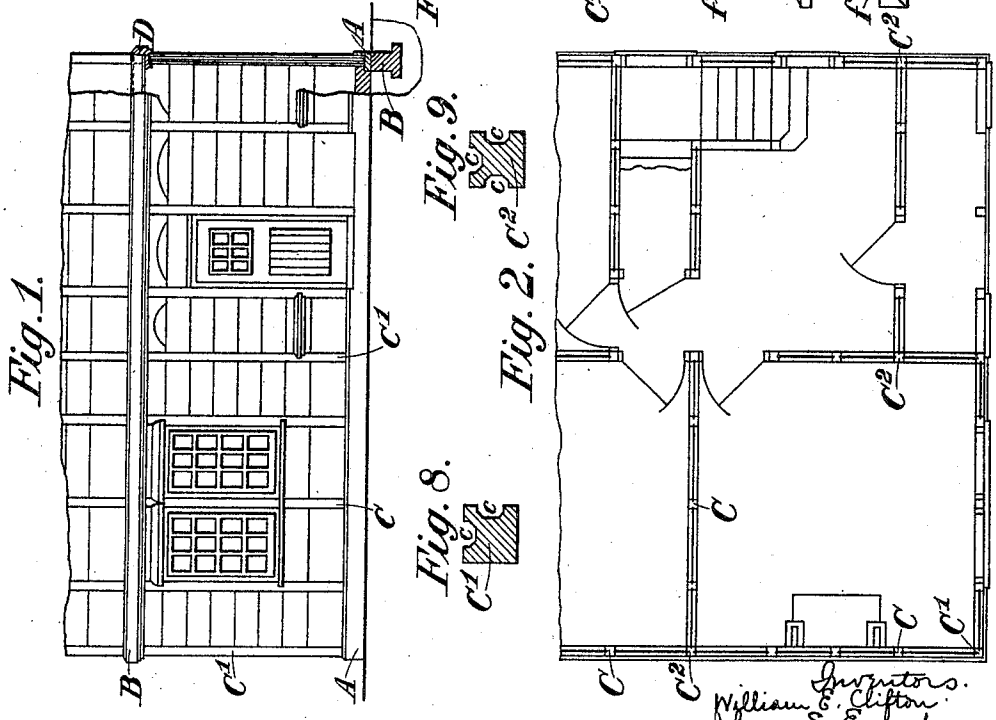
Mar. 27, 1923. 1,449,496.

W. E. CLIFTON ET AL.

CONSTRUCTION OF CONCRETE SLAB BUILDINGS.

FILED JUNE 27, 1921. 2 SHEETS—SHEET 1.





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CONSTRUCTION OF CONCRETE SLAB BUILDINGS.

FILED JUNE 27, 1921. 2 SHEETS—SHEET 2.

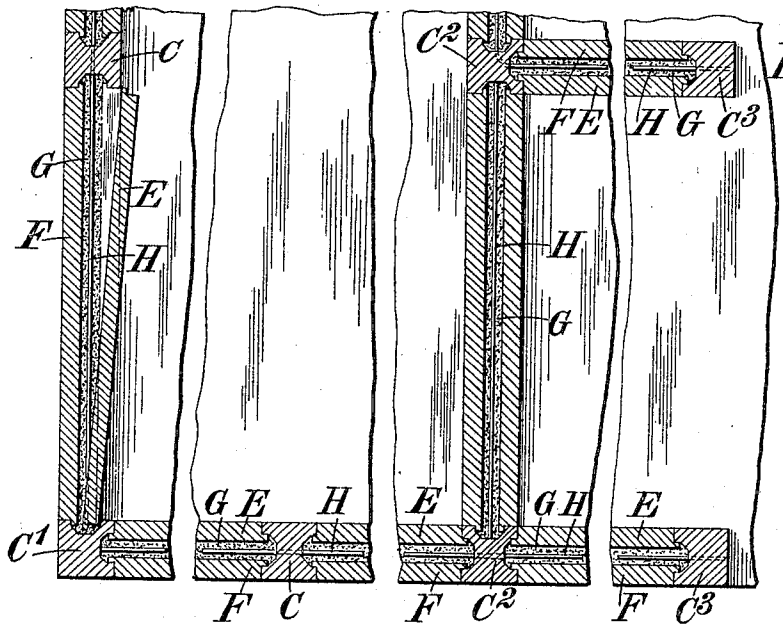


Fig.10.

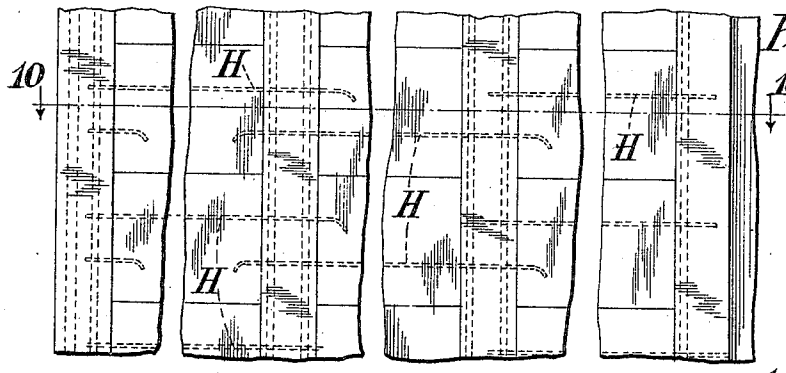


Fig.11.

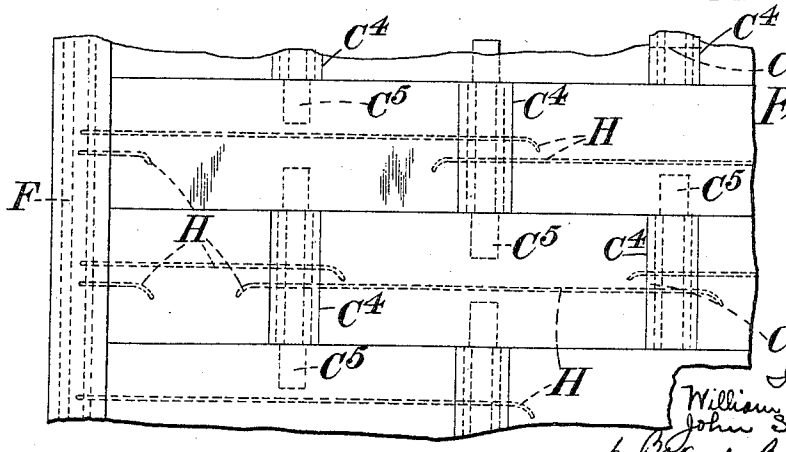


Fig.12.

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UNITED STATES PATENT OFFICE.

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CONSTRUCTION OF CONCRETE-SLAB BUILDINGS.

Application filed June 27, 1921. Serial No. 480,843.

(GRANTED UNDER THE PROVISIONS OF THE ACT OF MARCH 3, 1921, 41 STAT. L., 1313.)

To all whom it may concern:

Be it known that we, WILLIAM ERNEST CLIFTON and JOHN STURTON EWART, subjects of the King of England, both residing in Nottingham, England, have invented certain new and useful Improvements in the Construction of Concrete-Slab Buildings (for which we have filed applications in Great Britain July 10, 1919, Patent No. 153,633, and May 14, 1920), of which the following is a specification.

This invention consists in improvements in or relating to concrete building structures in which the walls are comprised of vertical stanchions or principals spaced apart at intervals in the walls with inner and outer filling-in slabs of concrete or the like disposed in the spaces between adjacent principals, and has for its object to simplify the construction so that a minimum of skilled labour is required and the cost of building consequently reduced.

According to the present invention for a concrete slab structure of this type a construction of vertical principal is employed whereby it is formed, as to its lateral surface which faces an adjacent principal, with a single vertically disposed recess wide enough to admit the edges of both inner and outer slabs and of such a depth that the slabs can be placed in position by inserting one edge in a recess in one principal and thereafter swinging the slab to bring its opposite edge into an opposing recess in the adjacent principal. Preferably the width of the recess from front to back is sufficient to accommodate the edges of both the inner and outer slabs with a space between them for grouting.

The invention also includes a filling-in slab having rebated edges for insertion into the recesses in the principals, the said rebates being such as to engage the edges of the recesses to prevent endwise movement of the slab in a direction parallel to its own plane after it has been adjusted in position. In one form of the invention the rebates are such as to afford flanges at the edges of the slab to engage inner faces of the recesses of the principals whereby the outer faces of the slabs can be adjusted flush with the outer surfaces of the principals.

The foregoing and other features of the invention will be more clearly understood from the following description of some preferred constructions described by way of example only with the aid of the accompanying drawings in which—

Figure 1 is an elevation, and

Figure 2 a ground floor plan showing part of a dwelling house constructed according to our invention;

Figure 3 is a sectional plan showing details of construction;

Figure 4 is an elevation;

Figure 5 a plan; and

Figure 6 an end view of one of the filling-in slabs formed with a moulding;

Figures 7 to 9 inclusive are cross-sectional views of the vertical frame members.

Figures 3 to 9 are drawn to a larger scale than Figures 1 and 2.

Figure 10 is a sectional plan of portions of some of the walls of a building, parts thereof being broken away;

Figure 11 is a partial elevation of the structure shown in Figure 10; and

Figure 12 is a similar view to Figure 11 of a modified construction.

Like reference letters indicate like parts throughout the drawings.

The framing of a building comprises a base frame A (see Figure 1) of the requisite shape in plan, which is laid on the ground or on a suitable foundation B, a series of vertical principals or stanchions C, C^1, C^2, which are spaced the requisite distance apart and extend up to the full height required in the ground floor walls, and a second horizontal frame D at the top of the vertical members C which is adapted to either carry the roof, or form a base frame for the floor and vertical principals of the walls of the next floor.

The base frame A may be constructed of reinforced concrete members of the requisite length and section, and if preferred, recesses may be provided in the upper face of this frame A to admit the lower ends of the vertical principals C.

In some cases a concrete floor is laid on the base frame A, and gaps are provided in the ends of the members which form the latter, to admit the lower ends of the vertical principals C.

After the base frame A is laid down, the vertical principals C are erected and temporarily held whilst the spaces between them are filled in with inner and outer filling-in slabs, as will be hereafter described. If preferred however the vertical principals C may be connected by stays or tie-rods which are disposed between the inner and outer sets of filling-in slabs.

The vertical frame principals C are in section formed with one or more of their sides recessed, and the said recesses are disposed according to the position the respective principals are to occupy in the building. For example, at intermediate points, principals C with recesses *c* in opposite sides as shown in Figure 7 are used. At the outer corners, principals C^1 with recesses *c* in two adjacent sides as shown in Figure 8 are used. At points where one wall intersects another, principals C^2 with recesses *c* in three sides as shown in Figure 9 are used.

The vertical principals described are disposed with their recessed faces at right-angles to the faces of the respective walls, and with their plane faces forming part of the face or faces of the wall, as shown in Figure 3.

The spaces between the vertical members C, C^1 and C^2 are filled in by means of inner and outer filling-in slabs E and F (see Figure 3) which are long enough to extend from one vertical principal C to another, and engage in the recesses provided for them in the faces of the latter. The filling-in slabs E and F are made of such a height that they can be conveniently handled by one man, and their ends are formed with a rebate *f* on the outer face, so that said faces can be brought up flush with the plane faces of the vertical principals C.

The recesses *c* in the vertical principals C are further made deep enough to admit of the insertion of the filling-in slabs E and F in position at the particular level they are to occupy. This is effected as shown in Figure 3, by inserting one end of the slab E for instance in its recess *c* before that of the other, after which the slab E can be adjusted in its proper position flush with the faces of the vertical principals and is then prevented from moving endwise by the rebates *f*.

The filling-in slabs are inserted in pairs, that is an inner one E and an outer one F at the same level, and they may then be temporarily retained in position by means of wedges placed between them, whilst the grouting G which permanently secures them in position is poured in. The grouting G may be of such a nature that it forms a damp-proof or non-conducting layer between the inner and outer slabs E and F, whilst the exposed faces of the latter may be of the character required to suit the interior and exterior decoration respectively.

If preferred the meeting edges of the filling-in slabs E and F may be bevelled off on their inner sides, so as to form a space into which the grouting G can enter and thus form a better joint between them.

When the ground floor walls are completed, the framing D is placed on the top, and this frame may be adapted to carry the first floor and form the base frame to carry the vertical principals of the first floor walls, and further floors may be added by repeating the construction.

The advantages of the construction described are that it is economical, the process of erection is simplified and can be rapidly carried on, the finished structure is substantial and weather-tight, whilst the temperature of the inner face of a wall of this construction, the inner filling-in slabs E of which may be composed of plaster or the like instead of concrete, is not affected by that of its outer face, and it is therefore well adapted for dwelling houses.

Where mouldings or sills are required, they may be formed on the filling-in slabs which are disposed at the points in the building where the moulding is required.

As shown for example in Figures 3 to 6, the filling-in slab F is formed integrally with a moulding F^1 at its lower edge. This slab F is adapted to fill the space above a window with the moulding F^1 directly above the latter so as to act as a weatherboard.

Referring to Figures 10 and 11, the vertical principals C, C^1, C^2 and C^3 are each conveniently moulded in concrete, cement or like material and are formed with vertical recesses on those faces which oppose one another. The principals C^1 are shown for use at the corner of the building, those indicated by the reference letter C serve as intermediate principals in the length of a wall unbroken by cross walls, those indicated by C^2 serve as intermediate principals where a cross wall is provided and those indicated at C^3 serve as principals for use at the termination of a wall or wall section as for example at a door or window jamb.

The recesses are of such dimensions that inner and outer filling-in slabs E and F can be inserted in the following manner at any position in the height of the principals after the latter have been erected. As shown on the left of Figure 10, as applied to an inner filling-in slab, one edge of the slab is first inserted to the bottom of the recess whereafter the opposite edge can be swung into line with the corresponding recess in an adjacent principal and then moved endwise to the position shown in

chain lines or in full lines in connection with the other slabs. The edges of the slabs are rebated so as to leave marginal flanges and shoulders which engage respectively with the inner edges of the recesses and the lateral faces of the principals to prevent the slabs from moving and also to hold the latter with their outer faces flush with the corresponding surfaces of the principals. The space between the slabs is then filled in with grouting G.

Each of the principals is formed with orifices which extend through them transverse of their length so that tie-rods H can be passed through corresponding orifices of two or more of the principals. The ends of the tie-rods may be left either extending straight or slightly downturned as shown in Figure 11. Tie-rods are embedded in the grouting G and the latter also flows into the orifices in the principals through which the tie-rods pass firmly securing the latter in position and tying the principals together.

It will be seen that the tie-rods will at the corners, pass through orifices which follow a curved path from recess to recess in the principal and a similar provision will preferably be made through the blocks such as C^2 for tying between the principals of one wall and those of a transverse wall.

In Figure 12 a modification of the construction of the wall is shown from that illustrated in Figures 10 and 11. In the latter the vertical principals extended completely throughout the height of a building or a floor or stage of the building whereas in the form shown in Figure 12 the vertical principals are shown in short lengths whereof those in one course are staggered with relation to those in the other course. In this case the short principals or locking members C^4 are formed with projections C^5 at their ends which are conveniently embedded in the grouting between inner and outer slabs of the courses above and below. In place of the projections C^5 the short principals C^4 may be formed with one projection C^5 and a slot indicated at C^6 registering above the space between the inner and outer filling-in slabs. In the case of the projections C^5 they will be embedded and secured in the grouting whereas in the case of the slots C^6 the grouting will flow into them and serve as a key to hold the short principals into position. In positions where principals such as C^1, C^2 and C^3 of Figures 10 and 11 are required they will preferably be in single lengths as previously described. The same system of tying the principals together by means of tie-rods H passing through orifices in the principals will be employed.

What we claim as our invention and desire to secure by Letters Patent is:—

1. In a building construction, the combination of two spaced vertical principals, horizontal courses each comprising pairs of inner and outer slabs and vertical locking-members for the slabs arranged between the said principals, the locking-members in one course being staggered in relation to those in the course next adjacent thereto, said principals and locking-members having each in a lateral surface that faces an adjacent principal a vertically disposed recess into which the edges of a pair of slabs enter, and means securing a locking-member in one course to a pair of slabs in another course.

2. In a building construction, the combination of two spaced vertical principals, horizontal courses each comprising pairs of inner and outer slabs and vertical locking-members for the slabs arranged between the said principals, the locking-members in one course being staggered in relation to those in the course next adjacent thereto, said principals and locking-members having each in a lateral surface that faces an adjacent principal, a vertically disposed recess, the slabs having each rebated edges entering into the recesses, and said rebates being so formed as to engage the edges of the recesses to prevent endwise movement of the slabs in a direction parallel to their own planes, and means securing a locking member in one course to a pair of slabs in another course.

3. In a building construction, the combination of horizontal courses each comprising pairs of inner and outer slabs and short vertical principals arranged between adjacent pairs of slabs in a course, the principals in one course being staggered in relation to those in the course next adjacent thereto, said principals having each in a lateral surface that faces an adjacent principal, a vertically disposed recess into which the edges of a pair of slabs enter, and each principal having means for locking the same to a pair of slabs in another course.

4. In a building construction, the combination of horizontal courses each comprising pairs of inner and outer slabs, short vertical principals arranged between adjacent pairs of slabs in a course, the principals in one course being staggered in relation to those in the course next adjacent thereto, said principals having each in a lateral surface that faces an adjacent principal, a vertically disposed recess, the slabs having each rebated edges entering into the recesses, and said rebates being so formed as to engage the edges of the recesses to prevent endwise movement of the slabs in a direction parallel to their own planes, said vertical principals having integral portions extending between the slabs of a pair of slabs in the courses next above and below the same.

5. In a building construction, the combi-

nation of two spaced vertical principals having each in a lateral surface that faces the other principal, a vertically disposed recess, and two slabs having each a rebated edge entering into the recess in one of said principals and a rebated edge entering in the recess in the other principal, each recess being wide enough to admit the edges of both slabs with a space between them for filling material and being of such a depth that the slabs can be placed in position by inserting one edge in a recess in one principal and thereafter swinging the slab to bring its opposite edge into an opposed recess in an adjacent principal, said rebates being so formed as to engage the edges of the recesses to prevent endwise movement of the slabs in a direction parallel to their own planes when the slabs have been adjusted in position with their outer faces flush with the outer faces of the principals.

6. In a building construction, the combination of a plurality of horizontal courses each comprising a plurality of pairs of inner and outer slabs and vertical principals arranged between adjacent pairs of slabs in a course, each slab having rebated edges at its ends, said principals having each in a lateral surface that faces an adjacent principal a vertically disposed recess into which the rebated edges of a pair of slabs enter, each recess being wide enough to admit the edges of both slabs with a space between them for grouting and being of such a depth that the slabs can be placed in position by inserting one edge in a recess in one principal and thereafter swinging the slabs to bring its opposite edge into an opposed recess in an adjacent principal, said rebates being so formed as to engage the edges of the recesses to prevent endwise movement of the slabs in a direction parallel to their own planes when the slabs have been adjusted in position with their outer faces flush with the outer faces of the principals, and tie-rods extending in the spaces between the inner and outer slabs from one principal to an adjacent principal.

7. In a building construction, the combination of two spaced vertical principals, a plurality of horizontal courses each comprising pairs of inner and outer slabs and vertical locking-members for the slabs arranged between the said principals, each slab having rebated edges at its ends, the locking members in one course being staggered in relation to those in a course next adjacent thereto, said principals and locking members having each in a lateral surface that faces an adjacent principal, a vertically disposed recess into which the rebated edges of a pair of slabs enter, each recess being wide enough to admit the edges of both slabs with a space between them for grouting and being of such a depth that the slabs can be placed in position by inserting one edge in a recess in one principal or locking member and thereafter swinging the slab to bring its opposite edge into an opposed recess in an adjacent principal, said rebates being so formed as to engage the edges of the recesses to prevent endwise movement of the slabs in a direction parallel to their own planes when the slabs have been adjusted in position with their outer faces flush with the outer faces of the principals or locking members, and means securing a locking member in one course to a pair of slabs in another course.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WILLIAM ERNEST CLIFTON.
JOHN STURTON EWART.

Witnesses:
CHAS. L. NORDON,
ALFRED HORNER.