Feb. 25, 1930. A. F. BEMIS 1,748,505

BUILDING

Filed Nov. 20, 1926

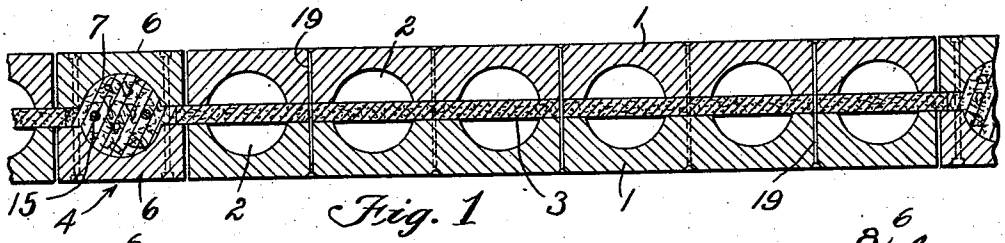
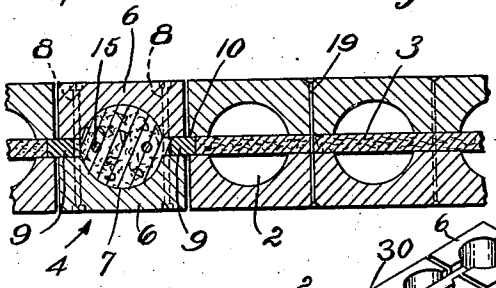


Fig. 1



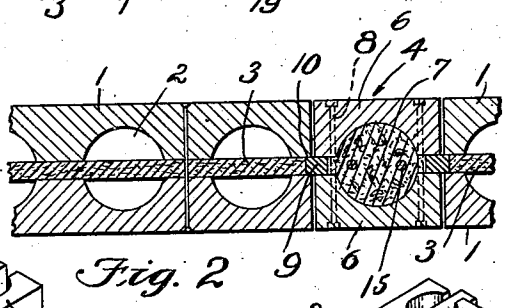


Fig. 2

Fig. 3

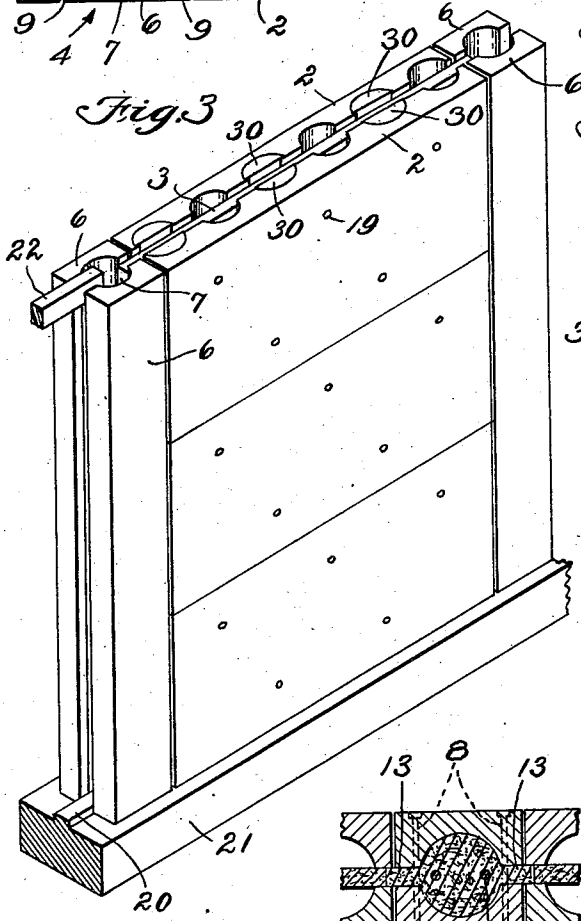


Fig. 4

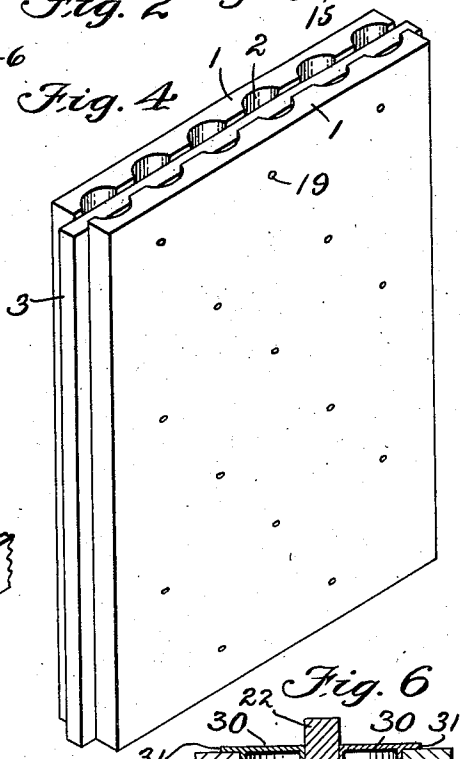
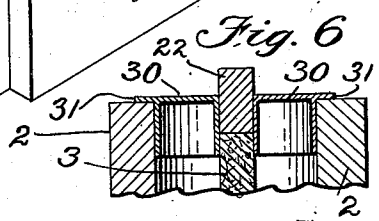


Fig. 5

Fig. 6



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Att'ys

Patented Feb. 25, 1930 1,748,505

UNITED STATES PATENT OFFICE

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BUILDING

Application filed November 20, 1926. Serial No. 149,765.

This invention relates to an improved type of building construction wherein the component units to form the building may be performed in a manufacturing establishment and rapidly assembled in situ. In certain aspects it pertains to the same general type of building constructions which are disclosed in my copending applications Serial No. 33,173, filed May 27, 1925; No. 36,851 filed June 13, 1925; and Nos. 72,673, 72,674 and 72,678 all filed December 2, 1925.

The present invention more particularly relates to an improved form of wall construction which may be rapidly assembled of preformed, manufactured units which not only permit facility of construction but also form a sturdy and rigid structure, the characteristics of which can be considerably varied to suit individual requirements. A wall of the type disclosed herein may be made moisture and fire resistant, being provided with an intermediate mineral seal for its entire extent, while at the same time numerous spaces for heat insulation are provided; these spaces also being adapted to receive wires, pipes or the like or to form ducts for ventilation or heating as well as being adapted to receive the poured cementitious material, which may, if desired, form monolithic extensions or connections with the main concrete frame members of the building.

The above and further objects and advantages of the invention will become apparent to those skilled in the art upon a reading of the subjoined description and claims in conjunction with the accompanying drawings, in which:

Fig. 1 is a horizontal cross section of one form of improved wall assembly;

Fig. 2 is a similar view of another form of wall assembly;

Fig. 3 is an isometric view of a portion of a wall;

Fig. 4 is a view of a slightly different form of wall section;

Fig. 5 illustrates a variant detail of assembly of slabs and columns; and

Fig. 6 is a sectional detail.

Referring to the accompanying drawings it may be seen that in general a wall constructed in accordance with this invention comprises a series of spaced vertical columns which preferably may be split in order to be keyed in a suitable manner to intermediate wall sections, which comprise outer layers of building units or blocks which preferably are assembled with a slab of mineral material therebetween.

Thus in certain aspects the present invention resembles the disclosure of my above-identified copending application Serial No. 36,751, since it employs split columns which are adapted to be secured to intermediate wall sections. However, the present form of wall section comprises outer layers each formed by a series of units or blocks 1, which may be composed of any suitable material, for example excelsior, wood shavings and the like, pressed and bound with an oxychloric cement, or any cementitious or ceramic material with or without a suitable aggregate. The inner side of each block 1 is provided with a series of vertically extending depressions 2 which in the form of the invention shown herein are illustrated as being of semicircular cross section, but which may be varied in shape as desired. Preferably, although not necessarily, the blocks 1 are symmetrical so that depressions 2 upon opposite sides of the wall and in adjacent courses will register or be in substantial alignment. Intermediate the blocks 2 is disposed a slab of mineral or cementitious material 3 to provide a seal. This slab may conveniently be composed of gypsum or a similar light cementitious material.

Formation of a wall section in this manner of three layers of material, namely oppositely located layers of building blocks or units 1 and a slab of mineral material 3 therebetween permits the convenient keying of the wall sections to the split columns 4. These columns 4 may preferably comprise complemental portions 6 providing an elongate central opening 7 therebetween and being held together by fastenings such as bolts 8. Preferably the members 6 of the column are adapted to have their edges clamped upon a key 9 which may also be inset between the edges of units 1, the slabs 3 having a length somewhat less

than that of the units to form a groove 10 for this purpose. When a wall of this character is built, one column may be placed in position with a key 9 inserted between the complemental halves 6 thereof and a slab 3 may then temporarily be held in place while the units 1 are located at the opposite sides thereof and clamped in position by wire staples 19 or any convenient securing means which may pass through the slab. After one wall section has been completed in this manner, a key 9 is located in groove 10 at the other end of the section and the adjoining column 4 is clamped to the key and then the next wall section comprising units 1 and slab 3 is assembled in a similar manner at the other side of the last erected column.

If desired the slab 3 may have a slightly greater length than the units 1 and its vertical edges may therefore comprise the keys which secure the wall section to the upright columns as disclosed in Fig. 1 and Fig. 4. In certain other cases cementitious material poured into the elongate openings 7 of the column 4 may have outward extensions 13 extending between the complemental halves of the column to comprise a key for the built-up wall sections (Fig. 5). Obviously, if desired, members 1 may be of one-piece construction for the entire height of the story or other similar dimension of the building to correspond to the preferred size of the slabs or cores 3, (Fig. 4). When the units and intermediate slab have similar dimensions they may be assembled before being brought to the building site in order to compose composite building blocks.

Any suitable aligning means may be used to hold the columns and units to the frame work of the building, such as, for example, illustrated in my above-identified copending applications, one especially convenient means being shown in Fig. 3, wherein the height of slab 3 is slightly less than that of several courses of units 1, whereby a key member 20 projects upwardly from foundation 21 and into the groove thus formed between the two lower units 1, thus holding them as well as the complemental column sections 6 to the foundation 21, while elongate keys 22 may similarly align the upper extremities of the wall sections and columns.

The spaces 2 may preferably be left unfilled to provide heat insulation, to comprise air ducts, or to permit the locating of wires, pipes, etc. in the wall, or if desired, they may be poured with cementitious material to any desired degree to provide the wall with added strength and rigidity, while the spaces 7 in the columns may ordinarily be poured with concrete or the like. The spaces 7 in the columns, as well as the spaces 2 in the units 1, are adapted to receive metal members 15 to reinforce concrete poured therein, if desired.

When it is desired to pour a concrete girt member or the like above the wall, the concrete may either be poured into the spaces 2 to form monolithic extensions of the girt or caps 30 may be inserted in the upper ends of openings 2 to maintain an air space in the same. These caps may conveniently be of semi-circular form (Figs. 4 and 6) to correspond to the shape of openings 2, having an outstanding flange 31 upon their circular margins, being adapted to have the straight margins abut the upper key member 22. If desired this key member 22 may terminate at each column 4 as disclosed in Fig. 3, while in other cases it may be desirable to provide a continuous member of this type.

Obviously key members of this character are adapted to act as reinforcements for concrete frame members either at the top or bottom of the wall sections as well as serving to tie the columns to one another. In place of the semi-circular caps 2, thin unitary plates may be located beneath the key 22 or similar members in order to cover depressions 3 at both sides to the wall.

Obviously a building construction of this type may be rapidly assembled, may be adapted to widely variant requirements, may be readily repaired or altered as desired, and is adapted to provide a highly satisfactory degree of heat insulation and of moisture and fire resistance.

I claim:

1. A wall section comprising a layer of units assembled at either side of a central cementitious core, said cementitious slab having a smaller longitudinal extent than the adjoining layers of units, thereby providing a continuous groove for keying the wall section to an adjoining part of the building.

2. A wall section comprising a layer of units assembled at either side of a central cementitious slab, said cementitious slab having a slightly smaller vertical extent than the corresponding units whereby a continuous groove is provided for keying the wall section to a horizontal frame member or for the introduction of reinforcing or tying members for the adjoining structural frame.

3. A wall section comprising a layer of units assembled at either side of a central cementitious slab, said cementitious slab having slightly different dimensions than the corresponding wall units whereby the edges of the wall section may be readily keyed to adjoining frame members.

4. A wall construction comprising complementary units assembled at either side of a slab of light cementitious material, said slab being slightly smaller than the building units thereby forming a groove between the edges of the units, keys in said grooves and columns comprising complemental sections at either end of the slab, said sections being clamped upon said keys.

5. A wall construction comprising split columns, layers of units at either side of a cementitious core, means whereby the split columns hold the core in place, openings in the units adjoining the core, said core having its upper surface depressed below the upper part of the units to provide a groove, a key inserted in said groove to hold the upper part of the wall to a girt or the like, caps in the ends of the said openings in the units and engaging said key to prevent filling of the openings with cementitious material or the like.

6. A wall construction comprising an intermediate substantially continuous mineral seal, said seal comprising a plurality of cementitious slabs in alignment with juxtaposed vertical edges and bipartite upright members located between the slabs and provided with a cementitious core aligned with said slabs, and a layer of building material arranged at each side of the slabs.

7. A wall construction comprising an intermediate substantially continuous mineral seal, said seal comprising a plurality of cementitious slabs in alignment with juxtaposed vertical edges, upright members associated with said juxtaposed edges, and having cementitious portions in alignment therewith, a layer of building material arranged at each side of the slabs between the upright members, and fastening elements extending through the slabs to hold the layers of building material in place.

8. A wall construction comprising an intermediate substantially continuous protective layer of fire-resistant material, said layer comprising preformed slabs in alignment with each other and having juxtaposed vertical edges, and upright members having fire-resistant cores between said juxtaposed vertical edges.

9. A wall construction comprising an intermediate substantially continuous protective layer of fire-resistant material, said layer comprising preformed slabs in alignment with each other and having closely spaced vertical edges, pairs of upright members adjoining the vertical margins of the slabs, and cementitious material poured in spaces between the slabs and portions of the upright members, whereby the preformed slabs and poured material cooperate in providing the substantially continuous protective layer.

10. A wall construction comprising an intermediate substantially continuous protective layer of fire-resistant material, said layer comprising preformed slabs in alignment with each other and having juxtaposed vertical edges, upright members having fire-resistant portions between the edges of the slabs, and a layer of building material disposed at each side of the slabs, said material being arranged to cooperate with the slabs in enclosing insulating voids adjoining the faces of the slabs.

11. A wall construction comprising an intermediate substantially continuous protective layer of fire-resistant material, said layer comprising preformed slabs in alignment with each other and having closely spaced vertical edges, pairs of upright members between vertical margins of the slabs, and cementitious material poured in spaces between the slabs and the upright members, whereby the preformed slabs and poured material cooperate in providing the substantially continuous protective layer, and a layer of building material disposed at each side of the slabs, said material being arranged to cooperate with the slabs in providing insulating voids adjoining the faces of the slabs.

12. A wall construction comprising an intermediate substantially continuous protective layer of fire-resistant material, said layer comprising preformed slabs in alignment with each other and having juxtaposed vertical edges, and upright members adjoining the vertical edges of the slabs, and building material secured to opposite faces of the slabs and projecting beyond the vertical edges thereof to provide keyways for securing the slabs to vertical frame members.

Signed by me at Boston, Massachusetts, this fourth day of November, 1926.

ALBERT F. BEMIS.