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N. GARRETT

1,841,586

METHOD OF BUILDING WALLS

Original Filed Nov. 13, 1924

Fig. 1.

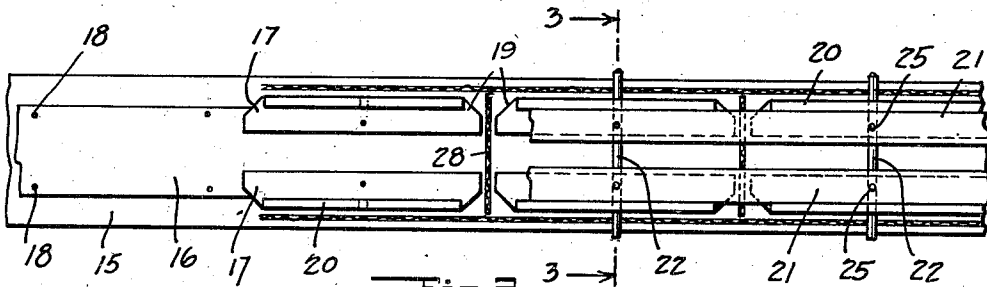


Fig. 2.

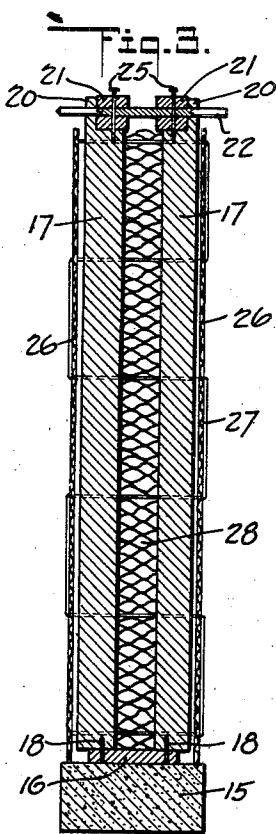
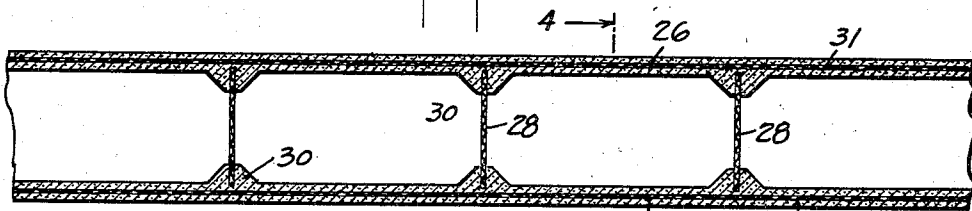


Fig. 4.

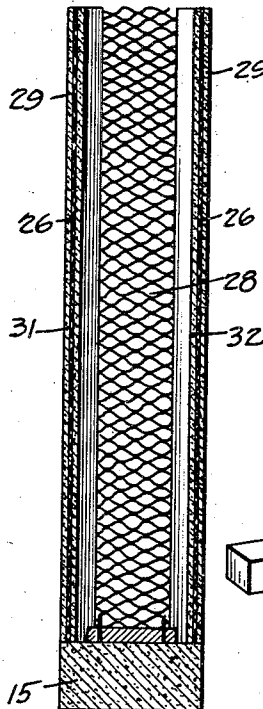


Fig. 5.

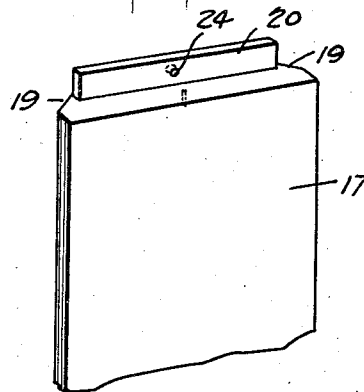
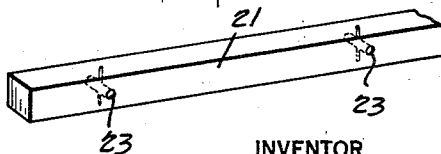


Fig. 6.



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METHOD OF BUILDING WALLS

Original application filed November 13, 1924, Serial No. 749,689. Divided and this application filed December 18, 1926. Serial No. 155,699.

My invention relates to building walls and is a division of my application Serial No. 749,689, filed November 13, 1924.

It is a purpose of my invention to provide a building wall and an extremely simple and inexpensive method of making the same, whereby permanent walls can be constructed of relatively thin layers of fireproof materials, thoroughly reinforced and webbed together to form a structure which is very substantial and possessing sufficient elasticity to allow it to bend or yield without breaking or cracking in order that it may successfully resist earthquake shocks.

I will describe a mode of procedure for building walls which makes possible a great saving in time and material and results in a structure which is lighter, more resilient, and better adapted to perform its function in structures than that resultant from other methods known to me. I will describe the method, point out the novel features, and show how this procedure accomplishes a useful result, and then point out the novel features thereof in claims.

As in the parent application, the height of the apparatus and structure shown in the drawings has been greatly reduced in proportion to its width for the purpose of conveniently showing the arrangement of the elements on the sheet of drawing paper.

In the drawings

Figure 1 is a view showing in top plan one form of wall building apparatus embodying my invention;

Figure 2 is a fragmentary horizontal sectional view showing one form of building wall embodying my invention;

Figure 3 is a vertical sectional view taken on the line 3—3 of Figure 1;

Figure 4 is a vertical sectional view taken on the line 4—4 of Figure 2;

Figure 5 is a fragmentary detail perspective view showing one of the forms embodied in the apparatus shown in Figures 1 and 3;

Figure 6 is a fragmentary detail perspective view of one of the alining members embodied in the apparatus;

Referring specifically to the drawings, and particularly to Figures 1 and 3, the ap-

paratus employed in the present instance comprises a base 15 formed of any suitable material and preferably having the cross sectional contour of a rectangle. Upon the upper side of this base is a strip 16 of wood or other suitable material provided for the purpose of producing a level base upon which is adapted to be set a plurality of forms 17. These forms are arranged in upright position, with their lower edges provided with holes in which is received the upper ends of pegs 18 secured within the strip 16. In this manner the forms are held upon the base and in edge to edge relation as illustrated in Figure 1 to produce two form walls disposed in spaced parallel relation. The forms 17 are placed upon the base so as to provide intervening gaps between the vertical edges of any two adjacent forms, with the vertical edges beveled as indicated at 19 for a purpose to be described hereinafter.

To maintain the upper edges of the forms 17 in proper spaced relation and in longitudinal alinement so as to effectively co-operate with the base pegs 18 in rigidly holding the forms in parallel spaced relation, I construct the upper edges of the forms with upstanding flanges 20 offset with respect to the inner faces of the forms to provide ledges on which alining members 21 are seated. The alining members may be formed of wood of any suitable length, preferably of such length as to span a plurality of forms in the manner illustrated in Figure 1. These members 21 are rigidly and detachably secured to the forms and to each other by means of pins 22 extended through openings 23 in the members and registering openings 24 in the flanges 20. Nails or other suitable fastening members 25 are extended vertically through the members 21 and the pins 22 as illustrated in Figure 3, for the purpose of locking the members to the pins and to thereby maintain the members contiguous to the flanges 20, whereby the upper edges of the forms 17 will be rigidly held in longitudinal alinement and in proper spaced relation to the other series of forms.

I provide between the vertical edges of adjacent forms transversally disposed strips of webbing 28. The positioning of these web-

blings is clearly illustrated in Fig. 1, and it will be noticed that they are of sufficient width to substantially span the space between the planes of the form faces.

Reinforcing elements 26 are held against the form faces by cords 27, entwined with respect to the mesh as illustrated in Fig. 3, and extending through the gaps between the forms. The irregular and elastic properties of most types of reinforcing is such that even though cords 27 are tight, the average spacing of the reinforcing elements 26 from the form 17 will be substantially as shown in the drawings. Cords 27 may also be considered

as connecting members.

In carrying out my method, cement, mortar or other plastic material, indicated at 29, is plastered against the outer faces of the forms 17 and over the reinforcing elements 26 so that when the material has set such elements will be embedded therein to thoroughly reinforce the resultant wall. The plastic material is applied laterally in such manner as to form an even coat over the outer faces of the forms, the material at the gaps between the forms, because of the beveled edges 19, producing truncated projections 30 (Figure 2) which are coextensive in height with the walls and in which the vertical edges of the webbing strips 28 are embedded. After the plastic material has been allowed to set and sufficiently harden, the apparatus can be removed from the wall by first withdrawing the nails 25 to allow the removal of the pins 22, and then removing the alining members 21. With the latter removed it will be clear that the several forms 17 can be lifted from between the confronting sides of the wall. The resultant structure thus formed is a double wall, the two parts of which are indicated at 31 and 32 in Figures 2 and 4 and a continuous dead air space therebetween. Because of this distinguishing feature from the wall resultant from the procedure in which the plastic material is laterally applied to a permanent expanded metal backing, it is important to note that in the finished wall the slabs 31 and 32 have the reinforcing elements totally embedded therein so that they are completely covered by the plastic material of which the slabs are formed. In this manner the reinforcing elements are protected against deterioration, while the slabs themselves are thoroughly reinforced throughout their entire areas. The strips or web members 28 serve to connect the slabs 31 and 32 at intervals and in a manner to transmit tension, compression and shearing between the slabs. They also brace the slabs against buckling under load. To do this, the connecting members should be substantially continuous or similar in construction between their lateral extremities. Such a connecting member may be termed homogeneous as contrasted with a composite mem-

ber which is essentially a central element provided with tie members at its lateral extremities.

Because of the distinguishing feature from the other methods of making double walls, which consist of casting them, it is important to note the mode of applying the layers of plastic material to the forms. As previously stated, the material is applied laterally, the word "laterally" being used in a broad sense to distinguish the method from previous methods of placing plastic material in the erection of a double hollow wall. It has been the common practice to pour the plastic material into forms. In the lateral method the material can be applied by means of a trowel as in the conventional plastering method or by means of a cement gun, or by applying the material by a spraying method, the material being sprayed on the form faces. In this manner each slab of the wall is formed of a plurality of laterally applied layers in which a richer film of concrete or other plastic material is brought to the surface of each layer, thereby producing slabs much less brittle and more resistant to shocks than in a wall formed by the pouring method. Another advantage of my method over the method of casting double walls is that in laterally applying the material it is pressed against the forms, excluding air and thus producing a more dense composition than is possible to make a structure of the same proportions by the pouring method as in the latter the material contains air bubbles and water pockets, thus decreasing its density. Those plastic materials which are commonly used in the formation of double hollow walls could not be poured at one continuous operation into forms to produce a structure of the proportions and having the properties herein described. Slabs comprised of laterally applied layers have many properties which distinguish them from poured slabs. In building construction my wall gives absolute insulation against the weather and effective insulation against the transmission of heat.

By forming openings at different intervals in the pins 22, varying the width of the base strip 16, and setting the pegs 18 the desired distances apart, the apparatus can be adjusted to form a wall of any desired thickness. To set the forms for any length of wall it will of course be necessary to have forms of which the width may be varied an amount equal to the width of one of the forms. A wall of any height which is less than the height of the forms 17 may be made by discontinuing the plastering operation at the desired height. A wall of greater height than the forms can be made by first building a wall with one setting of the forms and then placing a base strip similar to the base 16 upon the tops of the reinforcing elements 26 and building a wall on top of the strip thus

set in a manner identical with the method previously desired.

I claim:

1. A method of making structures consisting of erecting, within the space to be occupied by the structure, a removable form to provide outwardly disposed form faces; arranging a member in position so that portions thereof are exposed so as to be covered with plastic material applied over said faces; arranging reinforcements over said faces and over said portions of said member; laterally applying plastic material over said reinforcement and over said portions of said member and upon said faces; and removing said form.

2. A method of making building walls which consists in erecting a plurality of removable forms to provide pairs of outwardly disposed form faces spaced to provide intervening gaps; arranging web members within said gaps with portions thereof positioned to be covered with plastic material applied over outwardly disposed faces of said forms; arranging wire mesh over said faces and sufficiently close thereto to be embedded in mortar applied by ordinary plastering methods; plastering cement mortar upon said form faces, over said portions of said web members, and completely embedding said wire mesh in said cement mortar; and removing said forms.

3. A method of making structures characterized by spaced-apart cementitious slabs, which comprises erecting a pair of confronting tiers of form panels wherein the panels of each tier are in edge to edge relation and spaced apart to provide gaps therebetween, interposing portions of previously formed connecting members between and in gaps of the respective tiers and exposing portions thereof exteriorly of said pair of spaced apart and confronting tiers, plastering cementitious material on respectively opposite and outer faces of said tiers and covering said exposed portions of said connecting member therewith, letting the cementitious material harden and become bonded to the connecting members, then removing said form panels from between the slabs thus produced.

4. The herein described method of constructing spaced-apart walls of cementitious material and for yieldably connecting one wall with the other which comprises associating yieldable connecting members cross-wise of a form occupying area and in separable relationship to a knock-down form, exposing portions of the members with respect to the respective outer faces of the form, laying wall-producing plastic material over the outer faces of the form and over the exposed portions of the connecting members, permitting the wall-producing material to set and harden so as to establish a firm joinder be-

tween the walls thus formed and the exposed portions of the connecting members, and then removing the form from the space between the walls.

5. The method of making double walls by plastering cementitious material over two spaced sheets of slab reinforcing to form spaced wall slabs and simultaneously embedding in the cementitious material portions of homogeneous slab connecting members.

6. The method of making double walls by plastering cementitious material over two spaced vertical sheets of slab-reinforcing materials to form two spaced slabs, forming cementitious projections on opposed slab faces, and bonding portions of slab-connecting members in the projections.

7. The method of making double walls by plastering cementitious material over two spaced vertical sheets of slab-reinforcing materials to form two spaced plastered slabs, protruding portions of the plastered material into the form of inwardly projecting embedding-abutments for slab-connecting members, and bonding portions of slab-connecting members in the embedding-abutments.

8. The method of making double walls by plastering cementitious material against the exterior faces of two spaced vertical sheets of slab reinforcing to form spaced wall slabs, protruding portions of the cementitious material through the reinforcing and against forms to produce vertical ridges on opposed slab faces and simultaneously embedding in said vertical ridges portions of homogeneous slab connecting members.

9. The method of making double walls by plastering cementitious material against two spaced vertical faces of removable backing to form two spaced plastered slabs, using foraminous materials arranged over and sufficiently close to the faces to hold the plastered material while setting and for reinforcing the same after it has set, bonding portions of slab-connecting members in the slabs, and removing the backing.

10. The method of making double walls by plastering cementitious material against two spaced vertical faces of removable backing to form two spaced plastered slabs, using foraminous materials arranged over and sufficiently close to the faces to hold the plastered material while setting and for reinforcing the same after it has set, protruding portions of the plastered material into the form of vertical ridges on opposed faces of the slabs, bonding portions of slab connecting members in the protruded portions of plastered material, and removing the backing.

11. The method of making walls which comprises erecting a removable form to provide two spaced vertical form faces, arranging reinforcing over said faces, connecting the reinforcing of one form face with that of

the other form face with connecting members,
plastering cementitious material over said
reinforcing and against said faces as backing
and embedding portions of said connecting
5 members, letting the cementitious material
harden, and removing the form.

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