March 11, 1952 T. M. O'NEAL 2,589,021

MONOLITHIC HOLLOW WALL

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Fig 1

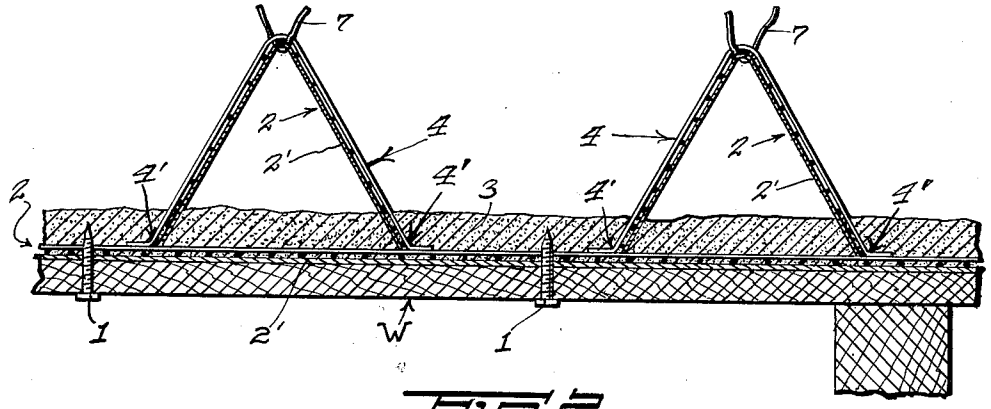


Fig 2

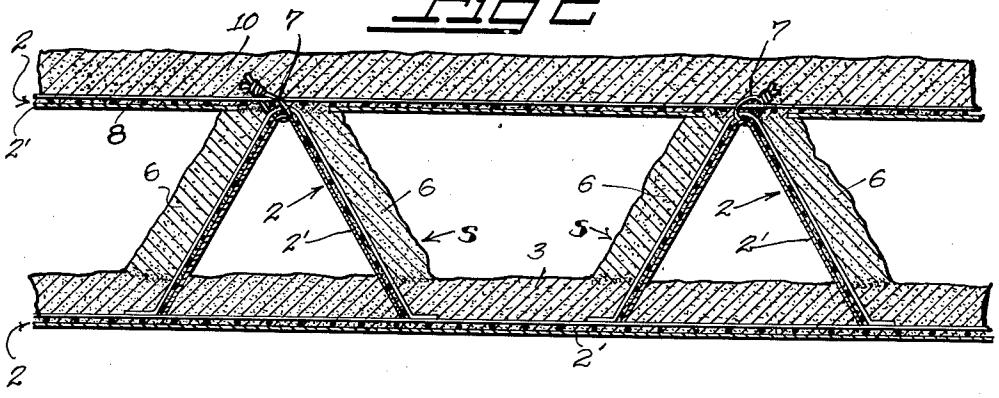
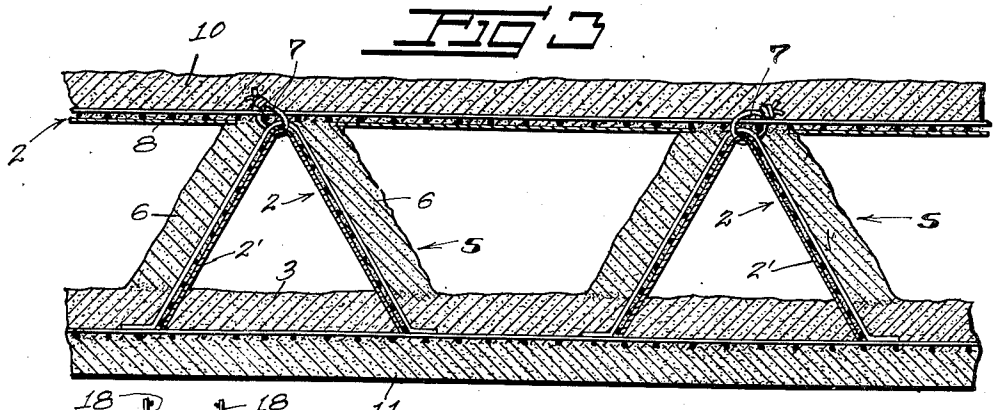


Fig 3



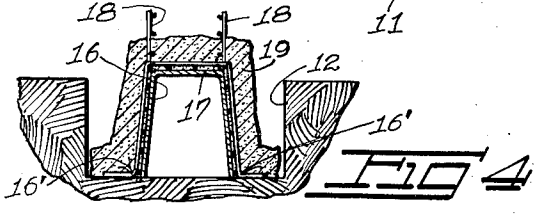


Fig 4

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MONOLITHIC HOLLOW WALL

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2 Claims. (Cl. 72—48)

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This invention relates to a monolithic wall and means for constructing the same and it is an object of the invention to provide a wall of this kind which is hollow and reinforced and constructed in a manner to provide space for air circulation.

It is also an object of the invention to provide a wall of this kind which excludes the necessity of painting, yet allows the use of coloring matter to be mixed with the cementitious material desired and wherein the construction and method of producing the wall is such to assure the wall becoming harder as time goes on which is reverse to the general type of construction of wood and cement.

It is a still further object of the invention to provide a device of this kind which does not require the use of wood, thereby assuring the wall being entirely fireproof.

These and other objects and advantages of the invention will be found from a reading of the subjoined description with the aid of the attached drawing.

In the drawing:

Figure 1 is a horizontal sectional view showing the first steps in erecting a wall;

Figure 2 is a similar view showing additional steps;

Figure 3 is a similar view showing a finished wall; and

Figure 4 is a fragmentary vertical section of a foundation constructed in accordance with the present invention.

As illustrated in the accompanying drawing, W denotes a false wall or backing of suitable material and against which the inner side of the wall is to be erected and formed.

In the producing of the wall the first step consists in attaching by screws 1 or in any other suitable manner, a sheet 2 of a reticulated or foraminous material preferably one that is made up of a coarse mesh metal fabric having a heavy paper pulp or gunnysack covering or backing 2', but a suitable metal fabric without such backing may be employed. This sheet 2 is placed flat against the backing or wall W and it is preferred that the attachments 1 be such that when desired, the backing or wall W can be easily removed after completion, or partial completion, as the case may be, of the monolithic wall.

After the sheet 2 has been applied, a layer 3 of suitable cementitious material, such as well-known Gunite cement is applied for a thickness of approximately ¾ of an inch, although this thickness is not to be understood as being an

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essential part of the invention as such thickness may be varied as the requirements of practice may prefer.

Before the layer 3 has set, the stud reinforcements 4 are applied or placed. Each of these stud reinforcements 4 is formed of lengths of the aforesaid fabricated material and is bent or folded to have a V-shaped section with the apex outwardly disposed. The free longitudinal marginal portions of the sides of the reinforcements are freed of the heavy paper reinforcement 2', where this type of fabric is used, for about an inch from the edge, and this is bent to an angle as at 4' and forced into the cement layer 3 and against the fabric sheet 2. The stud reinforcements 4 may be of such number desired and spaced apart as the requirements of practice may deem best.

By removing the paper reenforcement of the width of approximately an inch from the edge of the fabric and then bending the metal of the fabric at the newly formed edge, a portion of the paper reenforcement will be extended into the cement lamination as shown. However a greater extent or width of the paper reenforcement may be removed and when the edge of the fabric has been forced into the cement layer or lamination it will be seen that the cement material will bond through the meshes of the fabric above the angle 4' thereby more firmly locking the fabric material in position.

After each of the reinforcements 4 has been bonded in place, cementitious material is applied thereto, preferably Gunite, and floated to a desired thickness to provide the encasing layers 6. These layers 6 are floated to desired finish and allowed to set from between four to ten hours. These layers 6 and the fabric 4 provide the hollow studs S.

The outer or meeting end portions of the layers 6 of each stud S are substantially coplanar with the adjacent apex of the associated reinforcement 4. In the formation of the layers 6, the outer or meeting end portions, at the apex of the associated reinforcement 4, have embedded therein the wire strands 7, which are secured to the reinforcement and extend outwardly therebeyond a desired distance for a purpose to be hereinafter more particularly referred to.

After the layers 6 have been allowed to properly set, a foraminous or reticulated sheet 8 of the reinforcing fabric is laid directly across the apices of the reinforcements 4. Where such paper covered fabric is used the paper covering 2' is cut away to provide for the extension therethrough

of the wires 7. These portions of said wires 7 are secured to the fabric strands whereby the sheet 8 is firmly held in place. A layer 10 of cementitious material is then applied to the surface of the fabric 8, said layer 10 being "Gunite" cement. This layer 10, of course, is of desired thickness and is allowed to set. After the layer 10 has set as desired the wall or backing W is removed.

The paper backing of the fabric is removed to the width of the apex of the stud S so that the cement of layer 10 may pass through fabric 8 and bond firmly to the material forming the stud layer 6.

After the wall or backing W has been removed, the exposed face of the sheet 2 is washed off, after which there is applied thereto a layer 11 of cementitious material and of a thickness desired.

In view of the foregoing it is believed to be readily apparent that by the method and manner set forth, a monolithic wall is provided which is of a hollow type having vertically disposed flues to provide space for air circulation and it is also readily understood from the foregoing that the construction and method is one whereby the completed wall is practically substantially indestructible by fire, water, termites and the like, and that when completed, the necessity of using wood or kindred material is entirely eliminated.

While the invention as herein disclosed is particularly adapted for the construction of a vertical wall, it is believed to be obvious that it can be employed to the same advantage in the production of ceilings and roofs. It is to be stated that in the construction of roofs, heavy reinforcing material should be used.

It is also to be stated that the outer surfaces of the completed wall may be smooth or otherwise finished as may be provided and that the character of the wall is such as to eliminate the necessity of painting, although desired coloring may be effected by mixing the suitable color material with the cementitious material.

It is also to be stated that with the use of Gunite cement, the wall becomes more and more solid as time passes which is reverse to the general type of constructions of wood and cement of today.

Figure 4 illustrates the construction of a foundation in accordance with an embodiment of the present invention. In such construction, the spacer elements or studs 2 are each formed of a length of the metal lath or metal fabric, backed with heavy paper or gunnysack, as before stated, is shaped or bent into the form of a trough substantially V-shaped in cross-section, of the desired height and width. An approximate dimension would be six inches by twelve inches, the twelve inches representing the depth. This trough like form is made with the tapering side walls 16 and the connecting flat top wall 17. The side walls 16 have a portion along each longitudinal edge of about four inches in width, turned outwardly to form a flange 16'. When using a fabric having the applied heavy paper backing, the metal of the fabric is placed on the outer side of the trough structure.

A trench or excavation 12 is formed to desired depth and to a true level and the preformed metal fabric trough is then placed in the trench in inverted position as shown in Figure 4, with the outturned flanges 16' resting upon the bottom surface of the trench.

After being placed in the position shown the

Gunite cement is applied, covering the sides and top and the outturned flanges 16' as illustrated, the cement material being designated 19. After the application of this cement material there is then immediately embedded in the cement material at each side of the portion 17 of the metal fabric form, a strip of the metal fabric from which the paper backing has been removed. Such a strip may be preferably about four inches in width, the depth of the cement into it is embedded being approximately two inches thus leaving about two inches of the metal fabric projecting upwardly. These projecting strips 18 of the metal fabric provide a footing for the wall which is to be mounted or built up on the foundation thus constructed.

After forming such a foundation the hereinbefore described wall structure may be built up thereon by placing the false wall W vertically against the outer side of the foundation and then building up the monolithic wall thereon in the manner hereinbefore described.

The term "wall" as noted in the foregoing description and as also embodied in the appended claims, is intended to cover not only the usual upright walls of a building structure but also ceilings, roofs, rafters and foundation constructions.

From the foregoing description it is thought to be obvious that a wall constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated.

With the present invention a much cheaper wall can be constructed than is possible by using the present methods of setting up concrete structures. Accordingly the invention is particularly well adapted to the setting up of inexpensive houses such as farmers tenant houses, summer cottages, barns and the like. By eliminating completely the cement lamination 10 and the fabric reinforcement 8 there may be produced a single thickness wall finished smooth on the inside, with the studs S protruding on the outside of the building.

It is to be particularly pointed out that the construction herein disclosed is in no way similar to the well-known poured concrete type of construction where the use of heavy expensive forms is required. Aside from the single initially set up false wall, no form is required in carrying out the present invention.

I claim:

1. A monolithic wall construction, comprising spaced sheets of a reticulated reinforcing material, a layer of a cementitious material on each side of one of said sheets, substantially V-shaped members formed of folded lengths of said reinforcing material equidistantly spaced along one of the sides of said one sheet with the edges of the side portions thereof embedded within the cementitious layer on that side forming spaced hollow studs, a backing sheet covering the inner surface of each of said V-shaped members, a layer of cementitious material on each of the outer surfaces of said members, the second sheet of said reinforcing material extending between and joining the apices of said members and secured thereto, and a layer of cementitious material on the outer surface of said second reinforcing sheet.

2. The wall construction as defined in claim 1, with the said edges of the side portions of said members out-turned and forming footings dis-

posed in contact with the adjacent surface of the first named reinforcing sheet.

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