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2,035,172

WALL CONSTRUCTION

Filed Feb. 23, 1935

2 Sheets-Sheet 1

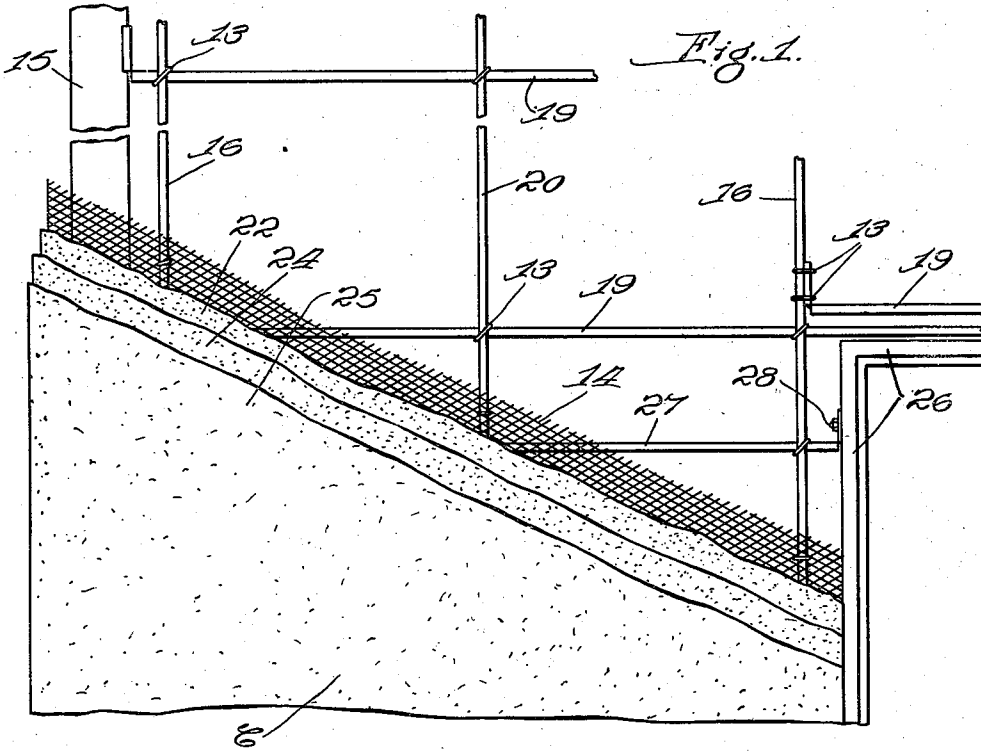
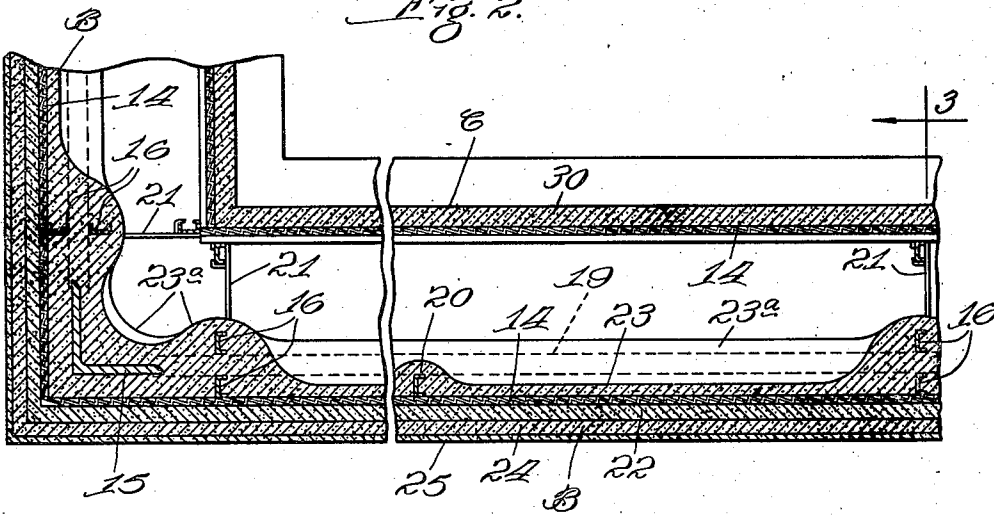


Fig. 2.



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Fig. 3.

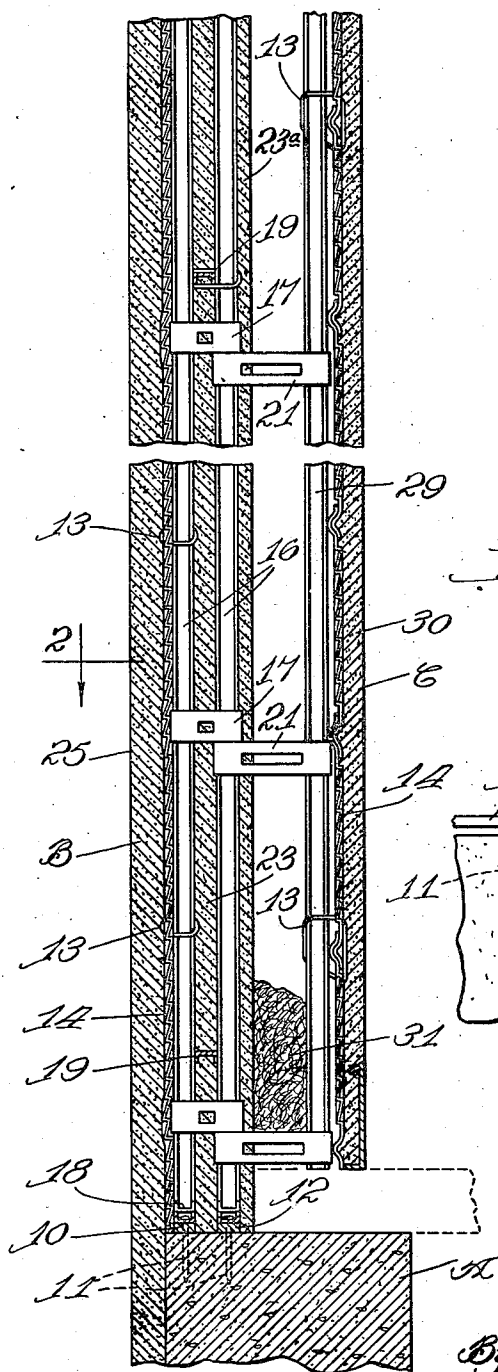


Fig. 4.

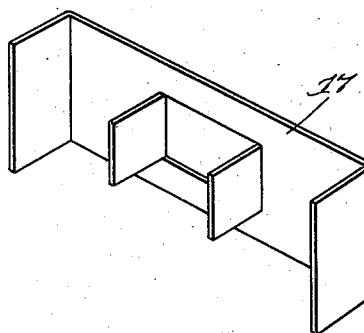
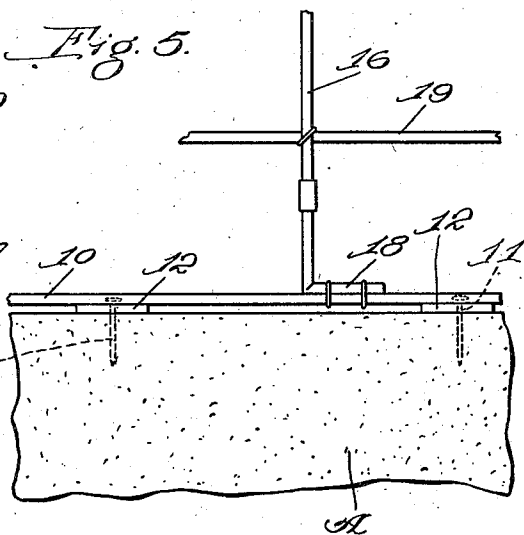


Fig. 5.



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WALL CONSTRUCTION

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8 Claims. (Cl. 72-43)

This invention relates to an improved fire-proof wall construction and more particularly to the steel work therein and method of constructing the same and applying cement and plaster.

5 The primary object of the invention is to provide a strong but inexpensive fire-proof construction in which the wall is made up of a plurality of integrally formed slabs which are reinforced with steel so that practically all of the
10 load is carried by column members.

A further object of the invention is to provide a construction in which small structural members are arranged and embedded in concrete in such a manner that the construction will be light
15 but highly resistant to wind stresses, shock, and the like.

A further object of the invention is to provide a wall construction having an inner wall and an outer wall with an intervening space for the reception of plumbing, ventilating pipes, and insulating material designed so that the outer wall may be finished very quickly and provide protection for inside workmen installing electrical work, plumbing work, or the like, and permitting the inner wall to be put in at any convenient later time.

The invention is illustrated in a preferred embodiment in the accompanying drawings, in which,—

30 Fig. 1 is a broken elevational view of a wall embodying the invention, with part of the construction broken away; Fig. 2, a broken plan sectional view taken as indicated at line 2 of Fig. 3; Fig. 3, a broken vertical sectional view taken as indicated at line 3 of Fig. 2; Fig. 4, an enlarged
35 perspective view of one of the separators used for spacing and securing the structural members together; and Fig. 5, a broken elevational view showing how the structural column members may be secured to a foundation.

In the embodiment illustrated, A designates a foundation upon which an outer wall B rests; and C an inner wall which is secured to, and supported by, the outer wall B.

45 The foundation A may be of any suitable construction, such as brick, concrete, or the like, and may have horizontal metallic structural base members 10 secured thereto by nails 11, or other suitable means. Preferably the base members
50 10 are raised slightly above the foundations by means of spacers 12, or are bent to provide space for the reception of wires 13 or clamps which hold metal lath 14 on the outer wall.

In some cases the outer wall B may be provided with large frame members 15 of any suitable cross section such as angle iron or the like and these members may be secured to the foundation and reinforce the construction. However, the wall consists primarily of pairs of
60 upwardly extending metallic structural mem-

bers 16 which are secured together in spaced relation by means of separators 17 to form double column members which are secured to the horizontal base members 10 as indicated at 18 in Fig. 5. Transverse structural members 19 are
5 interleaved between the members 16 and are fixedly secured thereto in vertical spaced relation. Additional single column structural members 20 are disposed at spaced intervals between the double column members 16 and are attached
10 to the outer base member 10 and to the transverse members 19. The metallic structural members may be of any suitable cross section although channel members, as shown in the drawings, are preferable. The vertical columns 16 and 20 are
15 arranged so that the finished wall will be divided up into integrally formed small slabs whose load is transmitted by the transverse members 19 to the column members 16 and 20. A satisfactory arrangement is to place the vertical columns 20
20 about sixteen inches apart for ordinary construction. The transverse members 19 may be spaced three or four feet apart.

It will be understood that after the structural members have been erected the metal lath 14
25 may be attached to the outer side thereof and separator members 21 attached to the inner side to grip the inner wall C. The outer wall is now ready for the first coat of cement 22 which may be applied on the outside with a trowel in
30 the usual manner. After allowing about two hours for the outer coat to set an inner coat 23 may be applied from the inside of the wall in any desired manner such as spraying, by hand, or the like. The inner coat 23 cooperates with
35 the outer coat in completely enclosing the column members and metal lath so that the steel is protected from moisture, fire, and other destructive forces. It will be understood that the cement will fill all spaces such as those between the
40 horizontal base members and the foundation, the space between the column members 16, openings in the expanded-metal lath, and thereby provide a very rigid construction. If desired, the inner coat 23 may be smoothed up with a trowel
45 but this step is not essential. An additional outer coat 24 and finish coat 25, which may be of color, can be put on at this time, or later, to suit the convenience of the builder. In either case it will be understood that the inside work-
50 men will have weather protection. Ordinarily the inner coat of cement will provide about $\frac{1}{2}$ " of covering for the steel work. In order to save material and weight it is flared out around the columns and transverse members as indicated
55 at 23^a. The outer coats should be about 1" thick.

This construction provides what is known as a coffer wall, or wall of sunken rectangular panels which are framed by the inwardly extend- 60

ing ribs formed by enclosing the transverse members and vertical column members. The panels, although light, have great strength and rigidity due to the arrangement of the ribs.

5 As shown in Fig. 1 a window frame 26 may be provided in the metal lattice work of the wall and is provided with outwardly extending arms 27 which are secured to the vertical column members and are firmly embedded in the cement 10 of the outer wall. The arms may be attached in any manner such as by bolts 28. Door frames and other parts may be installed in like manner before the cement is applied.

15 The inner wall C is formed by securing the structural members 29 to the separators 21 and to these structural members may be attached more metal lath 14 to receive plaster 30. As stated above, the intervening space will receive plumbing work, electrical work, or the like, and 20 the remaining spaces may be filled with any suitable insulating material 31 such as rock wool, asbestos fiber, or the like. In some cases it may be desirable to provide ties on the inside of the metal lath 14 on the inner wall to hold the insulating material from packing down.

25 Thus it will be seen that a wall is obtained wherein the only direct connection between the inner wall and the outer wall is by separators 21 whose cross sectional areas are so small as to be practically negligible as heat conductors. 30 Accordingly, the wall will have excellent heat insulating properties. The double column construction of small structural elements provides great rigidity without excessive use of material and is adapted to other concrete slab constructions other than walls, such as floors and the like.

35 The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

40 What I regard as new, and desire to secure by Letters Patent, is:

45 1. A wall construction comprising: a lattice work of pairs of upwardly extending metallic structural members rigidly secured together in spaced relation to form double columns, and 50 transverse metallic structural members interleaved between the first mentioned members and rigidly secured thereto in vertical spaced relation; lath secured to said lattice; and cementitious material enclosing said lath and lattice 55 work.

1 2. A wall construction as specified in claim 1, in which additional single column metallic structural members are provided at transverse spaced intervals between the double column members 60 and are secured to the transverse structural members and lath.

3. A wall construction comprising: a lattice work of pairs of upwardly extending metallic structural members rigidly secured together in 65 spaced relation to form double columns, and transverse metallic structural members interleaved between the first mentioned members and secured thereto in vertical spaced relation; additional single column metallic structural members 70 disposed at transverse spaced intervals between the double column members and secured to the transverse structural members; a window frame in said lattice work having laterally extending

arms secured to certain of said structural members; lath secured to the lattice framework thus formed; and cementitious material enclosing said lath and lattice framework.

4. A wall construction comprising: a lattice 5 work of pairs of upwardly extending metallic structural members rigidly secured together in spaced relation to form double columns, and transverse metallic structural members interleaved between the first mentioned members and 10 secured thereto in vertical spaced relation; additional metallic structural members secured to said double column members in parallel spaced relation in plane parallel to the plane of the lattice work; cementitious material enclosing said 15 lattice work to form an outer wall; lath secured to last mentioned structural members; and plaster secured to said lath to form an inner wall.

5. A wall construction comprising: a lattice work of pairs of upwardly extending metallic 20 structural members rigidly secured together in spaced relation to form double columns, and transverse metallic structural members interleaved between the first mentioned members and secured thereto in vertical spaced relation; additional 25 metallic structural members secured to said double column members in parallel spaced relation in plane parallel to the plane of the lattice work; cementitious material enclosing said lattice work to form an outer wall; lath secured 30 to last mentioned structural members; plaster secured to said lath to form an inner wall; and loose insulating material disposed in the space between the inner and outer walls.

6. A wall construction comprising: a founda- 35 tion; a pair of horizontal metallic structural base members secured thereto in spaced relation; a lattice work of pairs of vertical metallic structural members rigidly secured together in spaced relation to form double columns and fixed at 40 their bases to said base members, and metallic structural members interleaved between the structural members of the double columns and secured thereto in vertical spaced relation; additional single column structural members dis- 45 posed at transverse spaced intervals between the double column members and secured to the outer base member and to certain of the transverse structural members; metal lath secured to the outer wall lattice framework thus formed; inner wall 50 vertical structural members disposed in inward spaced relation to the double column members and secured thereto; metal lath secured to said inner wall structural members; cementitious material enclosing the outer wall lattice framework; 55 and plaster secured to the inner wall lath.

7. A wall construction comprising a plurality of integrally formed cement slabs having internal metal reinforcing means comprising lath, said slabs being formed with inwardly presented cement covered ribs formed of horizontal beams 60 and vertical column members disposed so that the load of each slab is substantially all carried by the column members.

8. In a building construction, a coffer wall 65 comprising: a plurality of integrally formed thin cement slabs reinforced internally with metal lath, said slabs being provided at their junction lines with rearwardly extending ribs formed of metallic structural members enclosed with cementitious material. 70

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