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BUILDING WALL CONSTRUCTION

Filed May 18, 1954

Fig. 1.

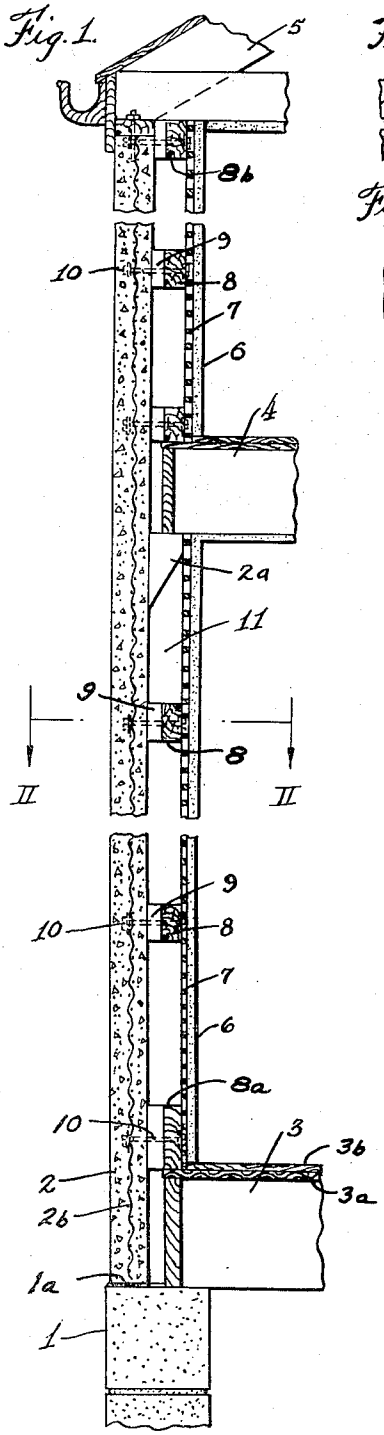


Fig. 2.

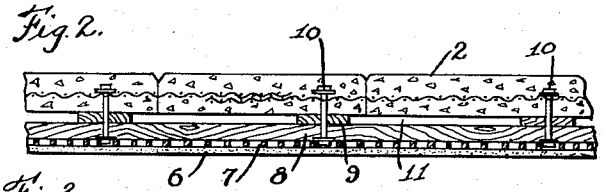


Fig. 3.

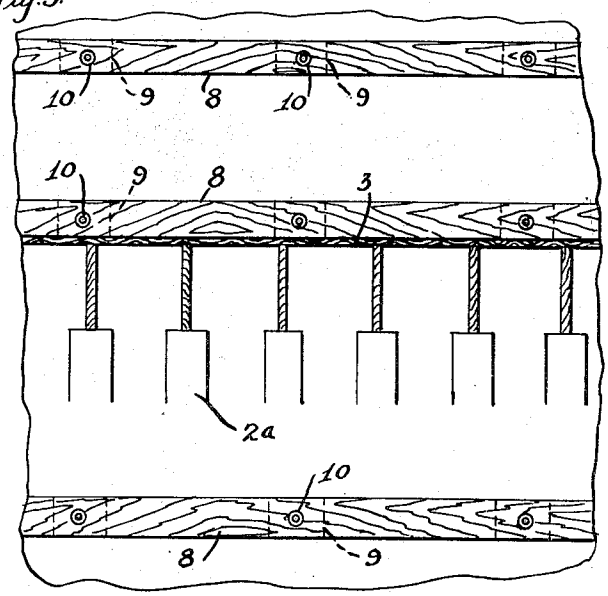
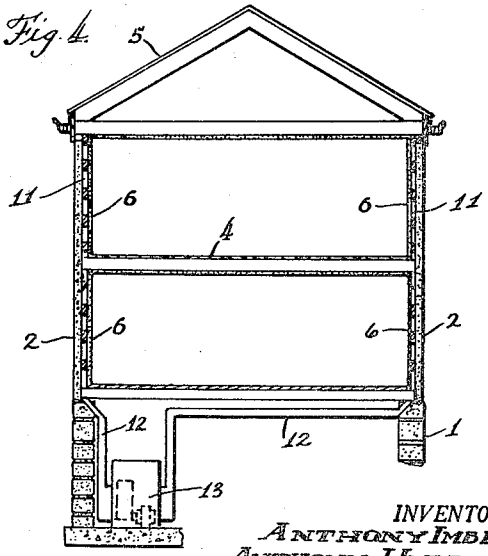


Fig. 4.



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BUILDING WALL CONSTRUCTION

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1 Claim. (Cl. 72—1)

This invention relates to a building construction, and, more particularly, to an economical building wall construction.

An outstanding disadvantage of conventional building wall constructions is that the wood framing construction requires a considerable number of overall length of 2" x 4" pieces to provide sufficient vertical studding to adequately support floor joists to sustain normal floor loading. A still further disadvantage of the use of vertical studding is that lateral air circulation between the inner and outer walls is prevented—also vertical circulation is prevented by horizontal studs at the various floor levels. This, we found, is a disadvantage from the standpoint of insulating against outside heat during the summer and against outside cold during the winter. Another disadvantage of conventional constructions is that they are expensive to assemble and require unduly long periods of time to erect.

An object of our invention is to provide a novel wall construction for buildings, such as dwellings, apartments, factories, and the like, wherein vertical studding is eliminated altogether, and instead only horizontal studding is provided to allow free lateral circulation of the air throughout the entire perimeter of the walls, and wherein spacer elements are provided between the horizontal studding and outer walls to enable also vertical circulation of air throughout the entire height of the walls.

Another object of our invention is to provide a building wall construction wherein the outer wall is made up of reinforced concrete and provided with ledges to support floor joists and thus eliminate the necessity of building an excessively strong wood frame construction without sacrificing over-all strength.

Other objects and advantages of our invention will become apparent from a study of the following description taken with the accompanying drawing wherein:

Figure 1 is a vertical cross sectional view of a wall construction embodying the principles of our invention, the rafter, floor joists and foundation being shown broken away;

Figure 2 is a horizontal sectional view taken along line II—II of Figure 1;

Figure 3 is a fragmentary elevational view of the inner wall before the lath and plaster are applied; and

Figure 4 is a vertical cross sectional view showing, schematically, how the inner wall space may be connected to an air conditioning system.

Referring more particularly to Figures 1 and 2, numeral 1 denotes a foundation wall which, for example, may be 10" blocks, having a mortar coating 1*a* on top thereof on which is erected a vertical concrete wall 2. Wall 2 preferably has a central wire mesh 2*b*, for instance a No. 5 mesh wire, throughout the entire medial plane of the wall. The wall 2 could be poured as a single integral unit by building forms (not shown). However, we prefer to build a wall from prefabricated slabs such as shown more clearly in Figure 2. These slabs may be fabricated either at the factory or at the

building site such as by pouring concrete on the subflooring between vertically extending forms for forming rectangular units. The metal lath of adjoining parts are preferably overlapped. The concrete may be a 1:2:4 mixture. Window and door frames are preferably placed and secured before the slab is poured to form an air-tight and water-tight joint with the concrete.

The reinforced concrete wall 2 is provided with integral ledges 2*a* at the second floor level which serve to support the second floor joists 4, the first floor joists 3 being supported on the foundation wall 1. Thus the floor load is supported mainly by the concrete outer wall construction. Sub-flooring 3*a* and flooring 3*b* is supported by joists 3. Horizontally extending furring strips 8 are provided, which are preferably 2" x 4", at vertically spaced intervals of 2' each, and throughout the entire perimeter of the house. However, at the floor level, such as on the first floor level (and other floor levels) 2" x 6" strips 8*a* may be used to provide an adequate base against which the floor trim may be nailed, and which strip may be bolted in place as shown. That is, the heads of ½" x 5" machine bolts, such as 10, are embedded in the concrete wall 2. Similarly the intermediate furring strips 8 are bolted by ½" x 5" machine bolts with a washer at each end and about half the length of which are embedded in the vertical concrete wall 2. A 2" x 4" anchor strip 8*b* is also bolted to the top of the wall 2, also having a washer at each end, and which are spaced at a maximum of about 3' apart to form an effective support for the roof construction 5.

It will be noted that spacer blocks 9, having central holes through which the bolts pass, are provided at horizontally spaced intervals as shown more clearly in Figure 3 so as to provide about a 2⅝" air space between the outer concrete wall 2 and the inner wall. The inner wall is made up of plaster 6 formed on Rocklath or metal lath 7. Blocks 9 may be of any suitable dimension such as 6" x 3⅝" x 1" in thickness. Bolts 10 are spaced up to about 4' apart horizontally.

The entire inner surface of the concrete wall 2 is preferably coated with tar in the form of two layers, the first layer a prime coating, and the second being painted on ⅛" thick. The spacer blocks each are preferably creosoted before placing.

It will be seen from the construction described that air can freely circulate horizontally between the horizontal studding or furring strips 8. Also air can circulate freely in a vertical direction throughout the entire height of the wall, particularly by virtue of the spacing provided between the horizontal furring strips 8 and the outer wall 2. This is a particularly important feature of our invention in that we have found, after considerable experiments, that the practice of trapping air between the walls is wrong in theory and that it is far better to allow free circulation of the air laterally and vertically throughout the entire perimeter and the entire height of the space between walls so that hot air which tends to become entrapped during the summer time between the inner and outer walls can be effectively withdrawn. Also cold air may be circulated to displace the hot air, or perhaps hot air may be circulated between the inner and outer walls during winter time.

A system for carrying this out is shown in Figure 4, wherein the space 11 between the inner and outer walls is connected by ducts 12 to a central heating and cooling system 13 of any well-known construction. Thus, in the summer time if the natural circulation of air is insufficient for removing hot trapped air between the inner and outer walls, the blower of unit 13 may circulate such air. If also desired, cold air from unit 13 may be introduced and circulated through a closed path which includes the space between walls, the attic space and

the unit 13. Of course, during the winter time warm air may be similarly circulated between the inner and outer walls.

However, we have found that an air conditioning unit 13 is not absolutely necessary and that if the space 11 between inner and outer walls freely communicates with the attic and basement spaces, the natural circulation is sufficient to cause enough movement of the air so as to withdraw hot trapped air during the summer, particularly such as normally occurs in the attic space, and replenishing it by the cooler air normally found in the basement. This natural circulation is generally caused by an outside breeze introduced, for example, in the window of the attic space which causes movement sufficient to allow the hot air, which normally rises, to fall instead, from the attic to the basement space.

Thus it will be seen that we have provided an efficient building wall construction which may be inexpensively and quickly assembled at the site in a much shorter period than customary for conventional constructions and which comprises a combination of reinforced concrete outer wall and a wood framing with horizontal instead of vertical studding, and by virtue of which considerably smaller overall length of studding is utilized, greatly reducing the cost of the wood studding; furthermore by providing integral ledges on the inner part of the outer wall this forms the main support for the floors and relieves the necessity of excessively strong or closer spaced wood framing; furthermore we have provided spacing elements on the horizontal studding which allows a complete, unobstructed air envelope throughout the entire perimeter and entire height of the building, and which freely communicates with the attic and basemen spaces (unless an air conditioning unit is connected thereto as shown in Figure 4) so as to permit free circulation of air between the inner and outer walls and thus effectively insulate against summer heat and winter cold.

While we have illustrated and described an embodiment of our invention, it will be understood that this is by way of illustration only, and that various changes and modifications may be made within the contemplation of our invention and within the scope of the following claim.

We claim:

A building comprising inner and outer walls, the outer wall being of cementitious material, furring strips between said inner and outer walls extending only in a horizontal direction and being in vertically spaced, parallel relationship and spaced from said outer wall, spaced elements disposed alongside said furring strip between said outer wall and strips, providing a substantially unobstructed air envelope throughout the entire height and perimeter of the building, said building including an attic space in communication with said envelope, and said outer wall including integral, horizontally spaced ledges directly supporting floor joists and thus transferring loading to said outer wall, the ends of said joists being spaced from said outer wall to allow horizontal movement of air in said envelope.

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