July 14, 1942. B. S. TURNER 2,289,469

BUILDING CONSTRUCTION

Filed March 12, 1940

Fig. 1.

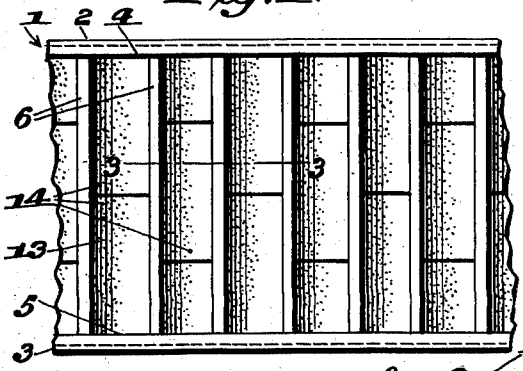


Fig. 3.

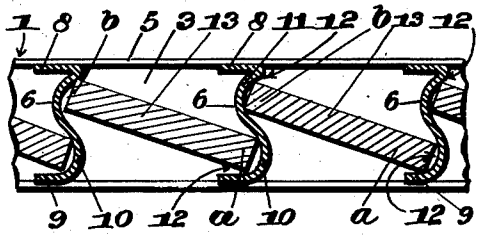


Fig. 7.

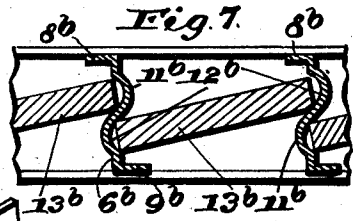
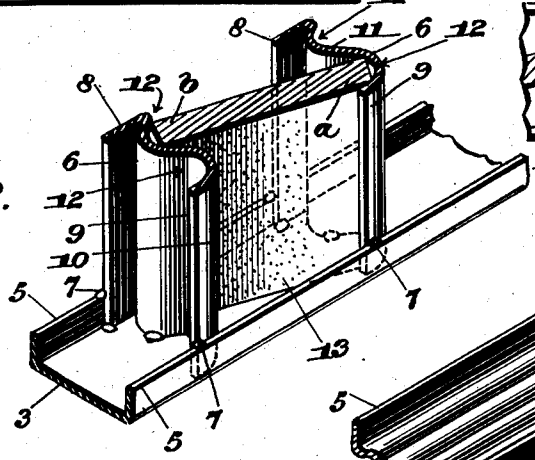


Fig. 2.



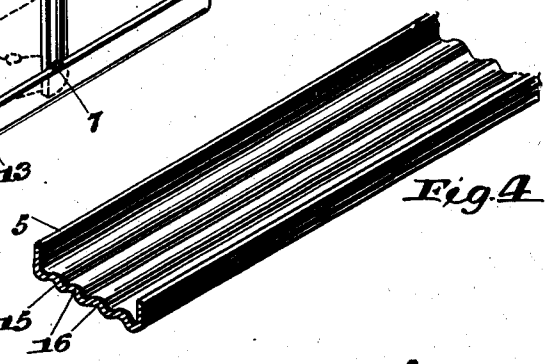


Fig. 4

Fig. 6.

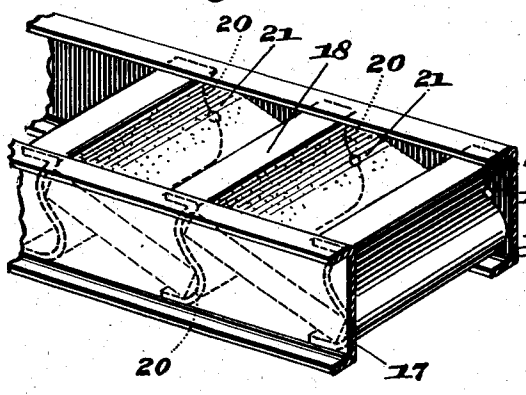
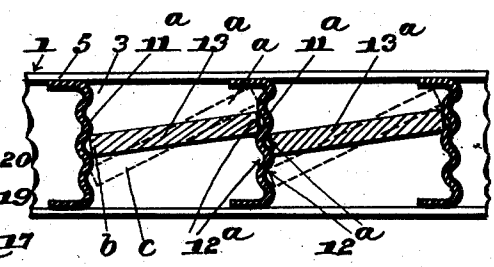


Fig. 5.



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Patented July 14, 1942

2,289,469

UNITED STATES PATENT OFFICE

2,289,469

BUILDING CONSTRUCTION

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Application March 12, 1940, Serial No. 323,618

2 Claims. (Cl. 189—34)

This invention relates to improvements in building construction, one of its outstanding purposes being both to facilitate the erection of a building and to render the walls, floors, ceilings and the like as nearly fireproof as is ordinarily possible.

The objects of the invention are:

First, to provide a building construction which eventuates primarily in a panel configuration, whether said configuration is a wall or a ceiling, the panels being formed preferably of non-inflammable materials.

Second, to provide a building construction wherein the fillers are readily emplaced in position and then held without separate fasteners.

Third, to provide a building construction wherein the fillers are permissibly of reasonably different widths and therefore capable of being fitted into the panel formation without the necessity of trimming.

Fourth, to provide a building construction wherein the studs or equivalent spanners are made of corrugated material for the double purpose of strengthening said material considerably, and of providing anchor flutes for the emplaced fillers.

Fifth, to provide a structural beam embodying a corrugated central section for the purpose of multiplying the factor of strength, the principle of corrugation being applicable to all types of beams such as I, L, Z channel and other shapes, and capable of use in both interior and exterior building constructions.

Other objects of this invention will appear in the following specification, reference being had to the accompanying drawing, in which:

Figure 1 is a side elevation of a portion of a wall panel, generally illustrating the scheme of the invention.

Figure 2 is a fractional perspective view of the wall panel.

Figure 3 is a cross-section taken on the line 3—3 of Fig. 1.

Figure 4 is a detail perspective view of a portion of a floor sill.

Figure 5 is a cross-section illustrating the embodiment of the invention in a floor or ceiling.

Figure 6 is a detail perspective view of a floor unit.

Figure 7 is a cross section illustrating the use of modified Z-beams or connectors for the retention of the panels.

Figure 1 illustrates a panel configuration generally designated 1. This is herein regarded as a wall panel, but as previously indicated, the identical structural principles are employed in the making of either wall, floor or ceiling units, or panels for other parts of the building either inside or outside. The panel comprises a cap piece 2 and a sill 3.

These members ordinarily comprise plain channels as illustrated in Fig. 2. Said channels are in the confronting relationship shown in (Fig. 1) so that the flanges 4, 5, of the channels can be used to assist in the securement of a plurality of connectors 6.

The connectors 6 will be recognized as the substitutes for the conventional studs. Being such, they are fairly regularly placed in the horizontal direction, and are secured perpendicularly to the cap piece and sill. Spot welds 7 (Fig. 2) are used as a convenient way by which to do the securing. These welds are applied both along the bottoms of the channels and at the flanges, thereby to hold the connectors rigidly in place. Considerable importance attaches to the nature of these connectors. They are desirably made of light-gauge metal, and virtually of any of the standard shapes such as I, L, Z channel, etc.

If of channel shape they include the flanges 8, 9, (Fig. 2) but the latter flange is a part of a decided curve 10 which, in turn, is one element of a system of corrugations 11 into which the web of the connector is formed. These corrugations provide flutes or valleys 12 on the opposite sides of the connector web.

Said flutes add materially to the strength of the connectors so that a light-gauge metal can be used as suggested before. For instance, it has been found that a beam of 16 gauge metal (.063), formed with a corrugated central section and loaded according to any common method, proved quite as strong as an ordinary ¼" channel iron. Thus said connector or beam comprises an important building unit, and one of its purposes of importance is the use of the flutes as the holding means for the fillers 13. These fillers are either made in sections, as at 14 (Fig. 1), or may comprise substantially full length members reaching from the sill 3 to the cap piece 4.

The flutes 12 confront each other across the spaces between the connectors 6. When the corrugations 11 comprise the simple ogee curves illustrated in Figs. 2 and 3, a matching pair of flutes 12 will result in the emplacement of the filler 13 in the diagonal position shown. The particular position of the fillers is not material because, as will presently be pointed out, the

corrugations can be made on such an order that the fillers will stand virtually parallel to the directions of the ceiling and cap piece.

The filler 13 will be made of fireproof material. It is not necessarily so made in all instances, but fireproof substances will obviously be necessary in the erection of a fireproof panel. Even in the event of the panel 13 being quite stiff it is, nevertheless, flexible enough to permit sufficient bending in order to get the filler into the position shown.

For example, the right edge *a* of the filler 13 (Fig. 2), can be slipped behind the flange 9 of one of the connectors 11, the other edge *b* being placed against the curve 10 of the next connector. By pushing inwardly on the filler at its approximate center there will be enough bending of the filler to force edge *b* over the crown of the curve 10 so that the filler will snap into the diagonal position shown because of its edges *a*, *b* then being pocketed in the confronting flutes 12.

It is not necessary for the filler 13 to be held tightly in said flutes. Nor is it necessary for each filler to be exactly the same width. There is room for variation in both respects, the underlying purposes being to emplace the filler, to make a fairly tight closure of the space between the connectors and to hold the filler in place without any fasteners other than the holding function performed by the flutes.

Reference is now made to Fig. 4 which is to be regarded as either a cap piece or floor sill. In the event of its being a floor sill, the body or web 15 is centrally corrugated at 16 in the longitudinal direction to materially increase the strength of the member. These corrugations tend to resist buckling, and the strength which they impart to the member enables making the member of lighter gauge material than would otherwise be necessary. When a member of this nature is used in the panel formation (Fig. 1) the spanners or connectors 6 would be fitted in and secured by welds as above.

In Fig. 5 all parts agree with the arrangement in Fig. 3 with the exception that the corrugations 11*a* are made more numerous. The flutes 12*a* are closer together as a consequence, thereby enabling the emplacement of the fillers 13 substantially in line with the sill and cap piece, or in substantial parallelism therewith as mentioned before.

The fillers emplaced according to the latter plan are illustrated in full lines (Fig. 5). The provision of multiple flutes carries with it another advantage, namely, the permissible use of fillers which vary considerably as to width. The dotted line position *c* denotes one of these variations; if the filler is too wide to fit between one pair of flutes, it can be adjusted in position to fit some other pair.

The floor unit in Fig. 6 comprises a pair of joist channels 17 which are held spaced apart by a series of spanners 18 which will be recognized as the equivalent of the connectors 6 in Fig. 1. The ends of the spanners are spot-welded to the joist channels at 19, and they are located at approximately even distances apart.

Said spanners 18 are also of cross-sectional ogee curvature. This agrees with the corrugated formation of the connector webs in Fig. 3. The resulting flutes 20 provide the holding means for the fillers 21, precisely on the same order as in the modifications before given. It can be readily understood that a wall, floor, ceiling or other panel adapted for embodiment in a building can be constructed with fair rapidity, especially when it comes to the emplacement of the fillers. The resulting construction is extremely satisfactory from the standpoints of its being durable and fireproof.

Fig. 7 illustrates the use of Z-bar connectors 6*b* in place of the channel shapes 6 in Fig. 3. The former have equivalent flanges 8*b*, 9*b*, but are characteristically extended in opposite directions from the main body of the respective bar. This makes for ease in the application of the insulating fillers 13*b* to the flutes 12*b* of the central corrugated sections 11*b*. Laths and plaster may be applied directly to the opposite sides of the vertical studs or a composition board may be secured thereto as is well known in the art.

Where floors are mnufactured in accordance with the present construction cement may be applied to the spaces between members 17, 18 and 21, as shown in Fig. 6.

I claim:

1. A building construction panel comprising a pair of members in spaced apart relationship, spaced apart connectors spanning the space between said members and secured to said members, each connector having at least a pair of concave portions, one of the concave portions being located adjacent one edge of the connector, the other concave portion being located adjacent the other edge and facing oppositely to the first concave portion so that the concave portion in one face of a connector of a pair will be diagonally disposed with the concave portion of the confronting face of the other connector and diagonally disposed filler means located in the spaces between the connectors and having one longitudinal edge seated within a concave portion of one connector adjacent one edge thereof while the other edge of the filler means is seated within the concave portion of the confronting connector, the last mentioned concave portion being adjacent that edge of the confronting connector which is diagonally disposed with the first mentioned connector edge.

2. A building construction panel comprising a pair of members in spaced apart relationship, spaced apart connectors spanning the space between said members and secured to said members, each connector having at least a pair of oppositely disposed concave portions, the concave portion in the face of one connector of a pair being diagonally disposed with respect to the concave portion in a confronting face of the other connector, and a filler plate diagonally disposed between each pair of connectors and having the longitudinal edges thereof received by the concave portions with said edges of the plate in frictional contact with said concave portions.

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