June 18, 1935. A. RAFTER 2,005,301

METAL FRAMES FOR CONSTRUCTING BUILDING BOARDS

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Fig. 1

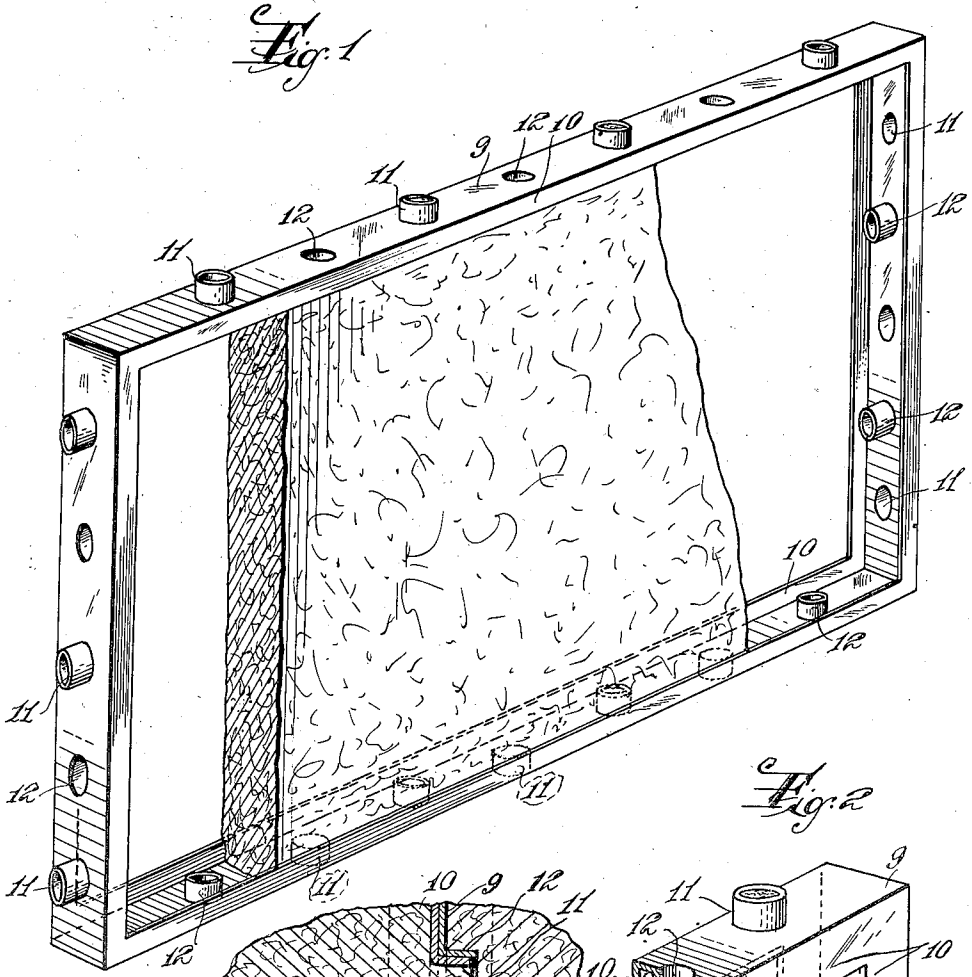


Fig. 2

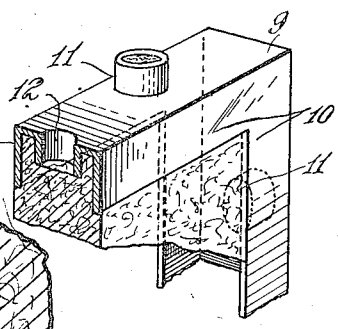
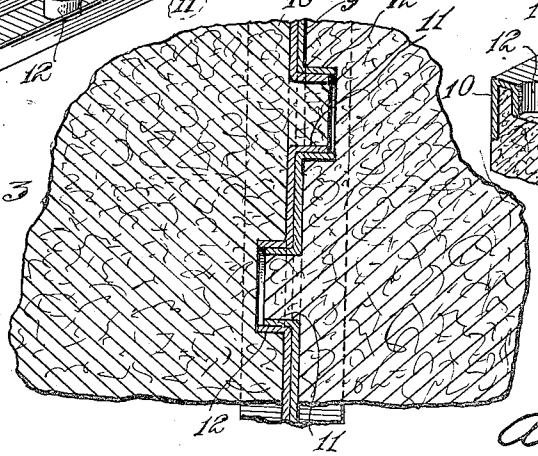


Fig. 3



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Fig. 4

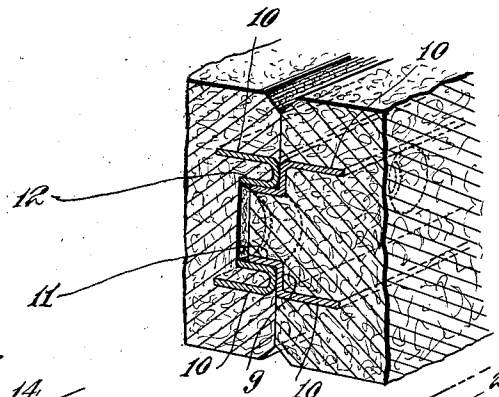


Fig. 5

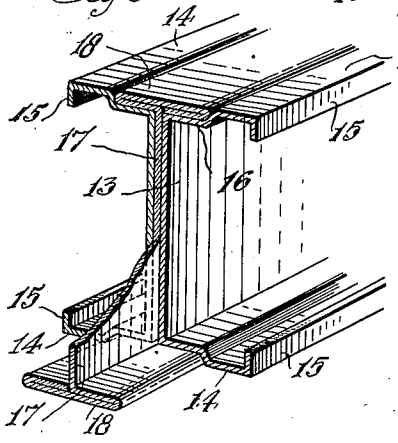


Fig. 6

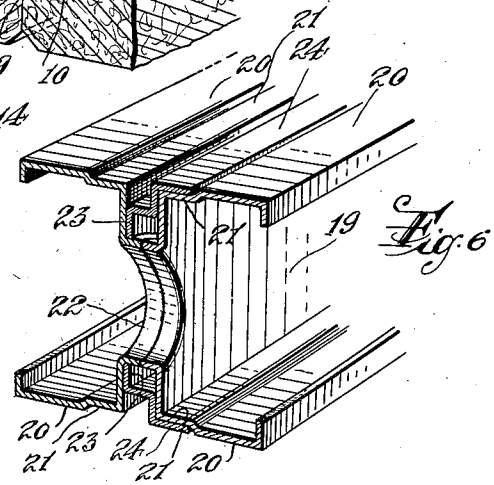
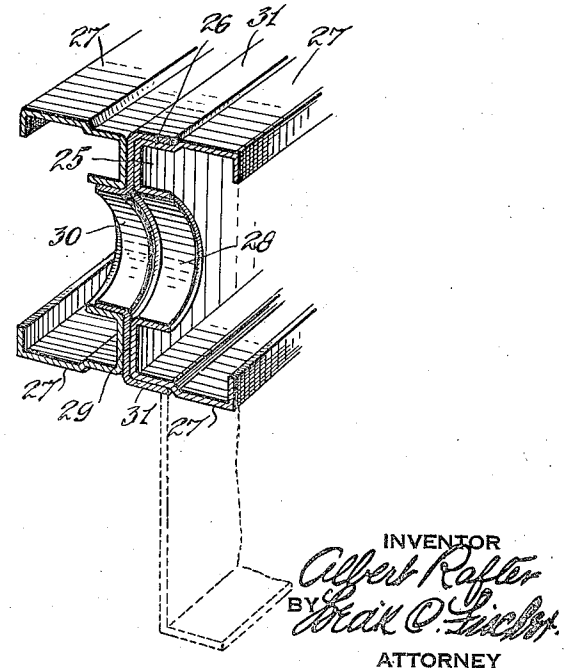


Fig. 7



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METAL FRAMES FOR CONSTRUCTING BUILDING BOARDS

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Application December 12, 1933, Serial No. 701,959

3 Claims. (Cl. 72—40)

This invention relates to building boards made from cementitious materials, and more particularly to improvements in channelled metal frames used in such boards.

There is now being generally used in building construction a board which is made from gypsum or similar cementitious material, and such boards have been found very desirable for use in the construction of ceilings, walls, floors and the like. Inasmuch as the strength of gypsum is not very great, it is necessary to reenforce such boards by channelled metal frames, which are provided with means to enable adjacent boards to be interlocked. Heretofore, the interlocking means used in such frames have been unsatisfactory in that they add considerable material to the frame and decrease the strength of the same, and the line of interlocking between adjacent boards is greatly weakened so that when force is applied to that point there is danger of breaking the interlock.

It is an object of this invention, to provide improvements in means for interlocking adjacent frames without decreasing the strength of the frame or causing a line of low resistance at the points of interlocking.

It is a further object of the invention to provide novel shapes and interlocking means in channelled frames for building boards, by means of which the strength of the frames is greatly increased, at the same time providing improved means for holding the gypsum or similar cementitions material to the frame.

These and other advantageous objects which will later appear, are accomplished by the simple and practical construction and arrangement of parts hereinafter described and exhibited in the accompanying drawings, forming part hereof, and in which:

Fig. 1 is a perspective view of a channelled metal frame for a building board embodying my invention,

Fig. 2 is a perspective view, partly in section, of a corner of a frame shown in Fig. 1,

Fig. 3 is a sectional view illustrating the manner in which two adjacent frames are interlocked,

Fig. 4 is a cross-sectional view of two adjacent building boards, showing novel shapes for the frames used therein, and the manner in which the frames are interlocked,

Fig. 5 is a perspective view, partly in section, of two adjacent frames of a modified shape, and having means for strengthening and interlocking the frame,

Fig. 6 is a perspective view, partly in section, of adjacent frame members of a modified form having the modified form of strengthening and interlocking means, and

Fig. 7 shows a modification of frame members and novel means for strengthening and interlocking adjacent frame members.

Referring to the drawings, in Fig. 1 a frame is shown to be rectangular in shape, and to be formed from metal channels, each of which has a bottom wall 9, and side walls 10. Struck outwardly from the bottom wall 9 are a plurality of spaced cylindrical flanges 11; and struck inwardly from the bottom wall 9 between the flanges 11 are similar cylindrical flanges 12. When the gypsum or similar cementitious material is poured into the frame, the material may be allowed to enter and fill the cylindrical flanges 11, but the flanges 12 are plugged during such operation so that none of the material may enter the flanges 12. Now, when it is desired to interlock two adjacent frames as shown in Fig. 3, the cylindrical flanges 11 which project outwardly from the bottom wall 9 of one frame member are inserted into the inwardly directed flanges 12, of the adjacent frame member.

In this manner two adjacent frames are positively interlocked and at the same time the joint between the adjacent frames is greatly strengthened due to the cylindrical flanges 11 and 12, which obviously displace metal from the longitudinal centerline of the bottom wall 9 to a position nearer the side walls 10 to provide a beam structure greatly increased in strength as is obvious to persons familiar with strengthening materials, it being understood that when in use, the forces are applied against the side walls 10 and transversely to the longitudinal axis of the bottom walls 9.

In certain instances, it may be desirable to have two adjacent sides of the rectangular frame provided with outwardly directed cylindrical flanges 11; and the other two adjacent sides of the rectangular frame provided with inwardly directed cylindrical flanges 12. Such a structure, of course, would necessitate the arranging of adjacent frames in a definite manner at all times.

In Fig. 4 is shown an adaptation of the invention where it is desired that the metal frame members be entirely concealed.

In Fig. 5 is shown a modified form of frame member which is made from a channel having a bottom wall 13 and side walls 14 which are provided with inwardly directed right angular flanges 15, each side wall 14 also having depressed portions 16 adjacent the junction of the side walls with the bottom wall 13. When it is

desired to join two adjacent frames of such a structure, there is provided between the bottom walls 13 of the adjacent frame members, a strengthening plate 17, which is bent to provide flanges 18 at right angles to the plate 17 and to give the strengthening plate a substantially I-shape in cross section. The flanges 18 rest upon the depressed portions 16 of the side walls of the channels, the flanges 18 being substantially flush with the raised portions 14 of the side walls as shown in Fig. 5. This structure also provides an unusually strong joint between adjacent frame members so that in the event of the application of force along the line of juncture there will be no possibility of breaking the board or joint or distorting the frame member.

In Fig. 6 is shown another modified form of frame member having a bottom wall 19 and side walls provided with raised portions 20 and depressed portions 21, the bottom walls 19 also having struck out therefrom a plurality of spaced cylindrical flanges 22. When it is desired to join adjacent frames having such a structure, there is provided between the bottom walls 19 a strengthening member which comprises a plate 23 having apertures therein through which the flanges 22 pass, the plate 23 being bent to also provide flanges 24 which rest upon the depressed portions 21 of the side walls. This structure by virtue of the flanges 22 provides a joint of great strength.

Referring to Fig. 7 there is shown a modified form of frame comprising a channel having bottom walls 25 and side walls at right angles thereto provided with depressed portions 26 and raised portions 27, the bottom wall having struck inwardly therefrom a plurality of cylindrical flanges 28. When it is desired to join two adjacent frames having such structure, there is inserted between the bottom walls 28 of the adjacent frames, a plate 29 having struck outwardly therefrom a plurality of spaced cylindrical flanges 30 adapted to fit in the cylindrical flanges 28 of the bottom wall of one of the frame members, and the plate 29 is also provided with right angled flanges 31 which rest upon the depressed portions 26 of the side walls of one of the frame members.

It will be seen from the drawings, and the description of the several modified forms of frame members disclosed herein that I have provided frame members of simple construction, but of great strength which are admirably adapted for use in connection with building boards made from gypsum or similar cementitious material; and it will also be seen that I have disclosed novel means for joining or interlocking adjacent frame members without in any way impairing the strength of the frame members or causing a weak joint which might be affected by the application of force along the line of juncture.

The foregoing disclosure is to be regarded as descriptive and illustrative only, and not as restrictive or limitative of the invention, of which obviously an embodiment may be constructed including many modifications, without departing from the general scope herein indicated and denoted in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A frame for constructing building boards of cementitious material, comprising a metal channel having a bottom wall and side walls at right angles thereto, said bottom wall having a plurality of spaced hollow cylindrical flanges struck outwardly along the longitudinal center line thereof and a plurality of spaced hollow cylindrical flanges struck inwardly, said inwardly directed flanges forming small cylinders having a diameter greater than the diameter of the cylinders formed by the outwardly directed flanges.

2. In combination with a pair of adjacent frames for constructing building boards of cementitious material, each of said frames comprising a metal channel having a bottom wall and side walls at right angles thereto, said bottom walls having a plurality of spaced cylindrical flanges struck outwardly along the longitudinal center lines thereof, a device for connecting said adjacent frames, said device comprising a plate having a plurality of spaced apertures receiving the spaced cylindrical flanges of one of said frames and having flanges engaging the side walls of the other frame.

3. In combination with a pair of adjacent frames for constructing building boards of cementitious material, each of said frames comprising a metal channel having a bottom wall and side walls at right angles thereto, said side walls having depressed portions adjacent the bottom walls, said bottom walls having a plurality of spaced cylindrical flanges struck outwardly along the longitudinal center line thereof, a device for connecting said adjacent frames, said device comprising a plate having a plurality of spaced apertures receiving the spaced cylindrical flanges of one of said frames and having flanges engaging the depressed portions of the side walls of the other frame.

ALBERT RAFTER.