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BUILDING WALL ASSEMBLY

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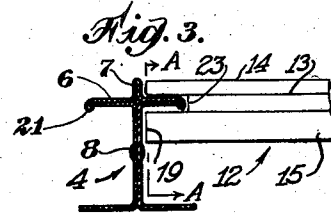
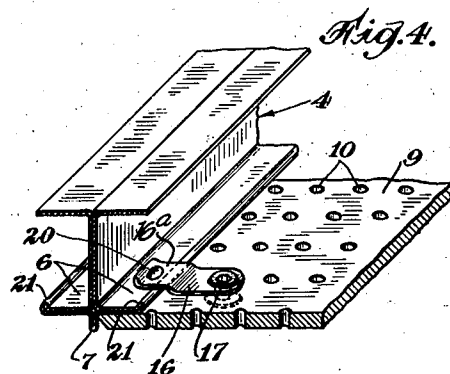
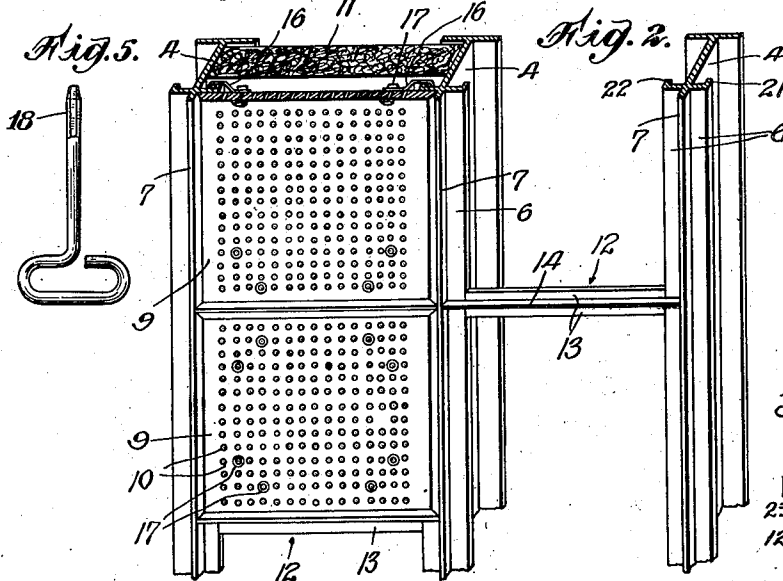
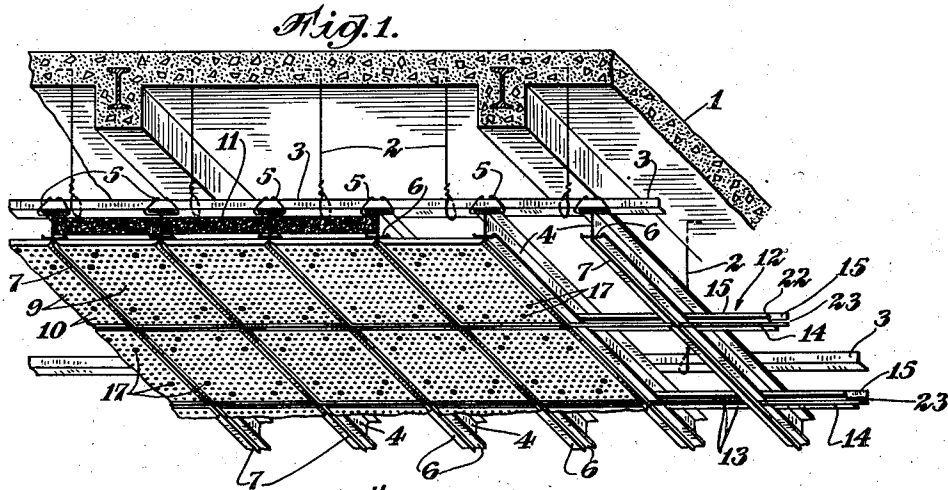
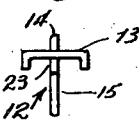


Fig. 6.



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BUILDING WALL ASSEMBLY

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10 Claims. (Cl. 72-118)

This invention relates to a building wall assembly and particularly to such an assembly adapted for use as a ceiling.

In assembled walls comprising preformed panels of facing materials, a number of difficulties are encountered. Thus, it is difficult to align the panels satisfactorily and also to prevent warping or deformation of panels that are sensitive to varying conditions of atmospheric humidity or are otherwise easily bent.

It is an object of this invention to overcome these difficulties and devise an assembled wall of pleasing and regular appearance, in which individual panels may be inserted or removed, from a forward position. Other objects and advantages will appear as the description of the invention progresses.

A preferred embodiment of the invention comprises an assembled wall, such as a ceiling of a building, including preformed panels of facing material, a supporting substructure, supporting members of the type of studs or bars, reinforcing members extending transversely with respect to the said supporting members, and means for securing the panels on all four edges thereof to the supporting and reinforcing members. The invention comprises preferably the provision of supporting and also reinforcing members, with panel-aligning elements integrally united to the faces thereof. Further, a preferred embodiment comprises turnable, spring-tightening clips, disposed behind the panel, that may be turned into locking position over a supporting or reinforcing member, by means of a sound-permeable element attached to the clip and extending through the panel to the exposed face thereof.

An embodiment of the invention that is preferred at this time is illustrated in the drawing in which:

Fig. 1 is a perspective view showing a ceiling assembled in accordance with the present invention, partly broken away for clearness of illustration;

Fig. 2 shows a perspective view illustrating in somewhat greater detail a portion of the assembly shown in Fig. 1, the exposed face of the ceiling being directed upward in Fig. 2;

Fig. 3 shows a cross section of a supporting member suitable for use as an I-bar or I-stud and a portion of a reinforcing member engaging a flange of the bar or stud;

Fig. 4 shows a perspective view from the back side of a portion of an assembly of a clip and facing panel of the type shown in lesser detail in Figs. 1 and 2;

Fig. 5 shows a side view of a tool adapted for use in turning the clip illustrated in Figs. 1, 2, and 4; and

Fig. 6 shows an end view on line A-A of Fig. 3.

In the various figures like reference characters denote like parts.

There is shown a supporting substructure including a building floor 1, suitably of concrete, with wires or rods 2 depending therefrom and supporting furring 3 of conventional type, such as angle irons or I-beams.

Supporting members or bars 4, extending across the purlins, are secured thereto in the conventional manner, as by wire loops 5.

The supporting members, herein sometimes referred to as studs, although extending either horizontally or vertically, are of improved type. They comprise a flanged face portion including the oppositely extending flanges 6. From the face portion there projects a continuous panel-aligning element 7 that may be in the form of the upstanding bead illustrated. The panel-aligning element is integrally united to the supporting member. In the form illustrated the supporting member and bead are formed of one piece of metal, by proper forming operations. In this form the supporting member consists essentially of an I-beam, spot-welded at 8 (Fig. 3), the flanged base of which is held against the purlin, and the flanged face portion of which is divided approximately into halves by the panel-aligning element extending along the middle of the face portion, in a direction that is parallel to the length thereof.

It will be noted that the flanged portion of the supporting members have each a strengthening web element extending from the face of the flange portion opposite the panel aligning element upstanding from the other face of the flange portion. In the structure illustrated, for example, in Figs. 2, 3 and 4 this strengthening element is the central or web element of a beam or stud of modified I-shape.

Secured to the flanges of the face portion of the supporting members are preformed panels 9. These panels are constructed preferably of relatively rigid material, such as a pressed and hardened composition including asbestos fibers and Portland cement. There may be used also less rigid panels, such as panels of sheet metal. In the improved structure of the invention, the panels alone may be somewhat deformable, say susceptible to warping or bending, when not supported. The panels may be closely perforated, as at positions 10, to admit incident sound.

Behind the panels there may be sound-absorbing material 11 or insulating material, say in the form of preformed, semirigid, porous units of rock wool and a binder. These units of sound-absorbing material may be disposed between the ribs of the I-supporting-members.

Extending transversely with respect to the said supporting members are the reinforcing members 12, provided suitably with a flanged face portion including the oppositely extending flanges 13 and an upstanding panel-aligning element 14, suitably in the form of a bead that divides the flanged face portion approximately into two halves, as illustrated; for strength, the reinforcing members may be provided also with a web member 15, extending approximately at a right angle from the back of the flanged portion. The reinforcing member is suitably constructed of one piece of metal or in such other manner that the various members are integral with each other.

To prevent the reinforcing member from being raised at either end, with respect to the plane of the supporting member, the web member 15 may extend beyond the flanged face portion and be engaged behind the flange 6 of the face of a supporting member, as shown at 19, Fig. 2. In other words, the reinforcing member may be provided, at either end, with a groove, say a saw kerf, adapted to engage the flange of an I-stud or I-bar. This groove is shown at 23 (Fig. 3).

The panels are secured on all four edges thereof to flanges of the members described. Thus on two sides the panels are secured to flanges of the said supporting members, while on the other two sides the panels are secured to flanges of the reinforcing members. This securing is accomplished suitably by means of clips provided with a spring-tightening element 16 and an element 17 constituting means for turning the clip and extending through the panel from its attachment with the tightening element, on the back of the panel, to the front or exposed face of the panel. The element 17 is suitably permeable to sound, say a hollow tube or eyelet, and, being inserted through one of the perforations 10, does not affect adversely the sound permeability of the panel or the appearance of regularity of spacing of perforations therein. This element 17 may be provided with an interior adapted to engage and to be turned by a tool inserted therein. Thus the interior of the tube may be approximately hexagonal in its outline and may be turned by the hexagonally shaped end 18 of the tool illustrated in Fig. 5.

The clip assembly of the type illustrated is turnable, the tightening element behind the panel and the tube within the panel, so that the clip may be turned, as by a tool inserted from a forward position, into locking position over the flanges of the supporting or re-enforcing members of the structure.

Suitably there is a plurality of these clips to each edge of the individual panels in the assembly, whereby each edge of the panel is held tightly, at a plurality of positions, to a supporting or reinforcing member, and warpage or bending of the panel is thereby minimized.

The clips may be provided with an irregularity of surface, say a teat 20, and the edges of the faces of the supporting members and the reinforcing members may be turned up as illustrated at 21 and 22, respectively, to form raised edges over which the teats are locked in the finished assembly. To facilitate engagement, the portion of the element 16a of the clip that is engaged

over the flange of the supporting or reinforcing members is offset from the portion 16 of the clip attached to the eyelet, as illustrated in Fig. 4.

The major part of the offset portion 16a of the clip extends in a direction approximately parallel to the plane of the remaining portion of the turnable element of the clip.

It will be noted that the flanged face portions of the transverse reinforcing members lie in the same plane as the flanges of the lengthwise supporting members, also that the panel-aligning elements upstanding, that is, projecting from these transverse members extend over the flanges of the said supporting members, approximately to the sides of the panel-aligning elements thereon. This is made possible by cutting away the flanged face portion and web of the transverse or reinforcing members and allowing the bead thereon to extend beyond or project over the ends of the remaining elements of the member, or by providing an end groove in the reinforcing members, as described.

While the assembly has been described particularly as used in a ceiling, it may be used as a side wall or other building enclosure. When used in a side wall, for example, the members referred to above as supporting members become the upright studs of the wall. These members, while illustrated as I-bars or I-studs, may be of other suitable shapes, as, for example, T's. The flanged face portions engage the panels at the edge portion of the panels and maintain the edges in a plane surface.

The panel-aligning elements on the mid-portions of the faces of the said supporting and reinforcing members, align the edges of the panel and give regularity of appearance to the finished assembly, even if the assembly is made by unskilled erectors, in a hurried manner. Also, these aligning elements, extending upwardly between the adjacent edges of juxtaposed panels, give a shadow effect which minimizes the conspicuousness of irregularities in widths or thicknesses of the said edges of juxtaposed panels. The upstanding panel-aligning elements have sides extending at approximately a right angle to the plane of the panels. Also, these elements may terminate substantially flush with the plane of the panels on the exposed surface of the wall assembly.

The details that have been given are for the purpose of illustration, not restriction, and many variations therefrom may be made without departing from the spirit and scope of the invention.

What I claim is:

1. A building wall assembly comprising a supporting substructure, preformed facing panels, supporting members engaging the backs of panels at the edge portions thereof, and rigid reinforcing members disposed transversely with respect to the supporting members and including each a face engaging the rear of juxtaposed panels at adjacent edge portions thereof and panel-aligning elements projecting from the said face and extending between adjacent edges of the said panels.

2. A building wall assembly comprising a supporting substructure, preformed facing panels, supporting members provided with flanged faces engaging the backs of panels at the edge portions thereof, and rigid reinforcing elements disposed transversely with respect to the supporting members and the said reinforcing members including flange faces engaging the rear of juxtaposed panels at adjacent edge portions thereof,

panel-aligning elements projecting from the said faces and extending between adjacent edges of the said panels, the reinforcing elements being provided with grooves, in either end, adapted to engage the flanged faces of the supporting members.

3. A building wall assembly comprising a supporting substructure, preformed facing units, supporting members provided with flanged face portions and turned up edge portions thereof, rigid reinforcing members disposed transversely with respect to the said supporting members and provided with flanged face portions, and securing means holding the edge portions of the panels to the said flanged portions of the supporting and reinforcing members, the said securing means being provided with an irregularity of surface adapted to be engaged behind the upturned edge of the face of the supporting member.

4. A building wall assembly comprising a supporting substructure, preformed facing units, supporting members provided with flanged face portions provided with an irregularity of surface on the backs thereof, and securing means holding the edge portions of the panels to the flanged portions of the supporting members, the said securing means comprising turnable clips disposed behind the panels and provided with irregularities of surface adapted to be engaged behind the said irregularities of surface on the backs of the face portions.

5. A building wall assembly comprising a supporting substructure, preformed facing units, supporting members provided with flanged face portions, and securing means holding the edge portions of the panels to the said flanged portions of the supporting members, the said securing means comprising spring-tightening clips disposed behind the panel.

6. A rigid supporting member for juxtaposed preformed panels in a structure of the class described, comprising a flanged portion, a panel-aligning element upstanding from one face there-

of, and a strengthening web element extending from the other face of the flanged portion.

7. A building wall assembly comprising deformable preformed facing panels including a compressed and hardened mixture of asbestos fibers and Portland cement, rigid supports and reinforcing members disposed at the edges of juxtaposed panels, and means for securing the panels, at a plurality of positions on each of the four edges thereof, to the supports and reinforcing members, whereby deformation of the panels is minimized.

8. A clip assembly, of the type described, comprising a turnable clip, means for turning the clip, a portion of the clip attached to the turning means, and a portion of the clip offset with respect to the first mentioned portion, extending in a plane approximately parallel thereto, and being provided with a depression of surface.

9. A building wall assembly comprising panels, supporting members and means securing the panels to the supporting members, the said members including each a face in contact with the backs of the edge portions of two adjacent panels and including a panel-aligning element integrally united to the said face, projecting therefrom, and extending between the said adjacent panels, and the outer portions of the panel-aligning elements and facing panels being substantially flush with each other on the exposed surface of the assembly.

10. A building wall assembly comprising a supporting substructure, preformed facing panels, metal supporting members including flanges engaging the backs of adjacent panels at the edge portions thereof, panel-aligning elements integrally united to the metal supports, projecting therefrom, and extending between adjacent edges of juxtaposed panels, and rigid reinforcing members disposed transversely with respect to the supporting members and engaging adjacent edge portions of juxtaposed panels.

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