

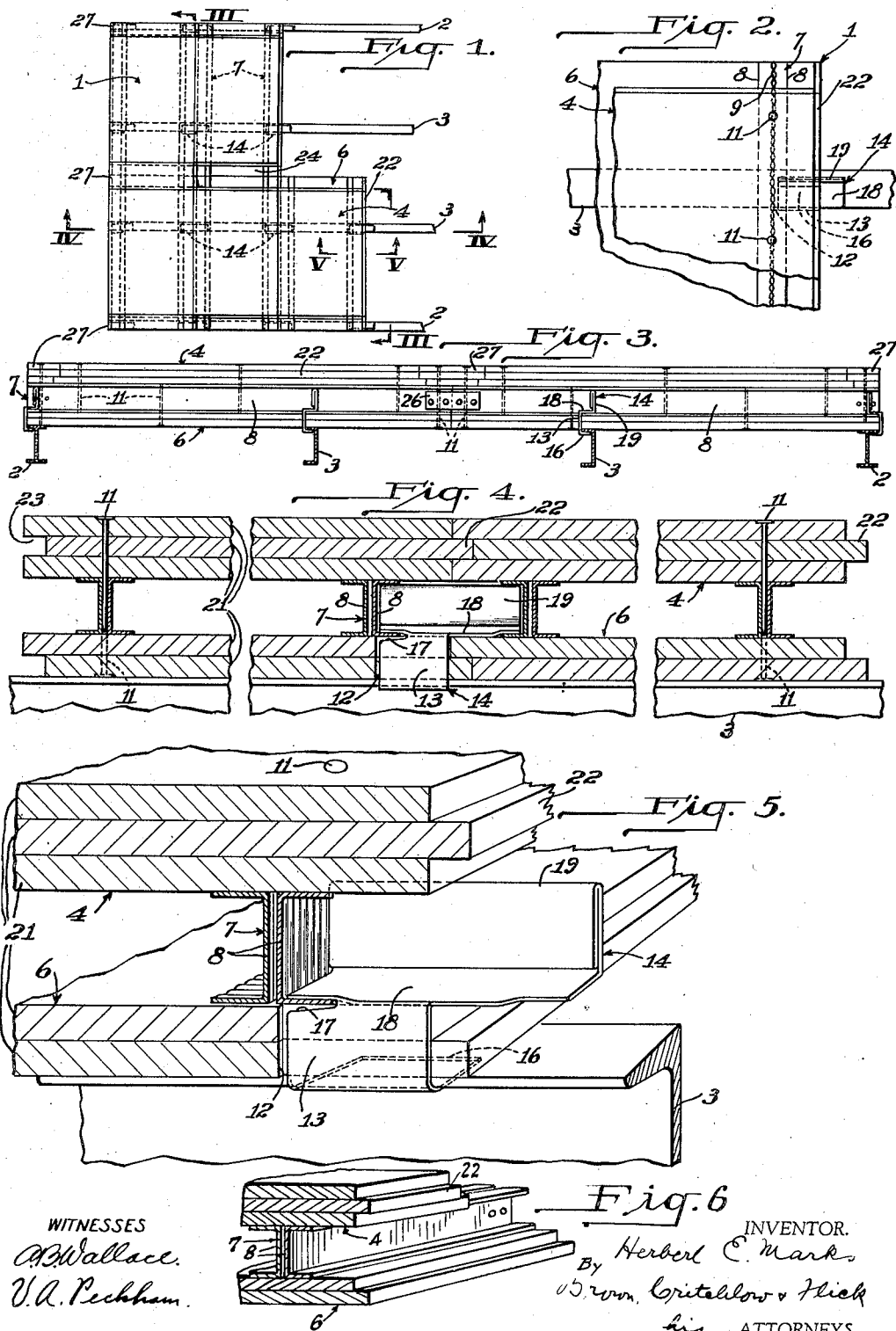
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PANEL STRUCTURE

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## PANEL STRUCTURE

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13 Claims. (Cl. 72-68)

This invention relates to building structures, and more particularly to wall or roofing structures.

In forming a wall or roof surface from panel units formed of slabs secured to elongate supporting members, it is difficult, if not impossible, to connect the supporting members of adjoining panels together when direct access to the ends of those members is prevented. Access is prevented when each slab extends from end to end of its supporting member or members, as has been the practice heretofore, whereby an unbroken surface is formed by the adjoining slabs engaging one another at their edges. When the supporting members are not connected to one another the surface structure is not as strong and rigid as it should be.

It is among the objects of this invention to provide a wall or roofing structure which is quickly and easily erected, which is strong and rigid, and which has a continuous surface on both sides throughout its area.

The preferred embodiment of the invention is illustrated in the accompanying drawing in which Fig. 1 is a plan view of several panel units connected to a supporting framework; Fig. 2 is an enlarged fragmentary plan view of a corner portion of one of the panel units; Fig. 3 is an enlarged side view of the panel units taken on the line III-III of Fig. 1; Fig. 4 is a transverse section thereof taken on the line IV-IV of Fig. 1; Fig. 5 is a greatly enlarged perspective view taken in the general direction indicated by line V-V of Fig. 1; and Fig. 6 is a fragmentary perspective view showing the relation between the ends of the upper and lower slabs and their supporting member.

In accordance with this invention a plurality of structural panel units are disposed end to end in adjoining rows against a supporting framework to which they are attached. Although the invention can be embodied in a wall, it is especially applicable to forming a subsurface on which roofing is to be laid and which must be especially strong and durable because it is on the outside of the building. The panel units are formed from slabs of plaster board, wall-board, or the like spaced apart by elongate supporting members, and the slabs are so arranged that access is given to the ends of the supporting members so that those of one panel unit can be rigidly connected to those of an adjoining unit. After those members have been connected the space between the ends of adjacent slabs is closed by a filler block. The panel units are adapted to be at-

tached to their supporting members by clips that are concealed and locked in place by the panel units themselves.

Referring to Fig. 1 of the drawing, a plurality of prefabricated structural panel units 1 are disposed end to end in adjoining rows against a supporting framework made up of spaced parallel members which may be I-beams 2 and channels 3. In a roof structure these channels would be the purlins. Preferably, as shown in the remaining figures, each panel unit is made from a pair of slabs 4 and 6 spaced apart in parallel relation by elongate supporting members 7. Each of the latter is most suitably formed by securing together the webs of a pair of channels 8, the webs being corrugated transversely whereby openings 9 are formed between them (Fig. 2). The slabs are laid against the flanges of these channels, and nails 11 are driven through the slabs and into openings 9 where they are securely gripped by the channel webs.

Although the panel units can be connected to members 2 and 3 in various ways, it is in accordance with this invention to use clips for this purpose which are locked in place and concealed by the panels themselves. After a panel unit has been laid against the flanges of the I-beams and channels its inner slab 6 is provided in one edge adjacent the edges of those flanges with inwardly extending slots 12 which can be formed in any convenient manner, such as by saw cuts. Into each slot is slipped the web 13 of a channel-like clip 14 the inner flange 16 of which projects under the flange of the underlying framework member, as shown in Fig. 5. Slot 12 preferably extends about half way past the adjacent supporting member 7 of the panel, and the inner end of the clip web is notched at 17 so that the outer flange 18 of the clip can overlie a flange of the supporting member as well as the inner slab. The slab and framework members are thus securely clamped together by the clips.

Clip flange 18 extends laterally outwardly for overlying the edge portion of the adjoining panel's inner slab when it is shoved up against the first panel, as shown in Fig. 4, whereby a single clip connects two panels to a framework member and is locked in place by the panels and concealed by their outer slabs 4. Also, clip flange 18 is reinforced against bending by an integral flange 19 extending outwardly at right angles from one side edge thereof, and the latter flange may in turn be strengthened by folding it double.

Each slab of each panel unit is preferably

formed of a plurality of boards 21 connected face to face. If paper-faced plaster boards are used and are cemented face to face a slab is produced which is very strong and durable for its weight.

- 5 A suitable panel unit may have an inner slab formed from two boards, and an outer slab formed from three boards. To rigidly connect the sides of adjoining panel units the middle board of each outer slab 4 is preferably offset laterally relative to the other two boards to provide a tongue 22 at one side of the slab and a tongue-receiving groove 23 in the opposite edge. Likewise, the two boards forming inner slab 6 are offset laterally relative to each other to provide a lap joint with the adjoining inner slab. Thus, adjoining panel units interlock with one another along their side edges, as shown in Fig. 4.

Inner slabs 6 extend from end to end of supporting members 7 so that the inner slabs of adjoining panel units abut at their ends, as well as at their sides, and form a continuous inner surface (Figs. 1 and 3). On the other hand, it is a feature of this invention that the panel units are so formed that access is given to the ends of adjoining supporting members when the units are disposed in adjoining relation to permit those members to be rigidly connected together. This is preferably accomplished, as shown in Figs. 1, 2, 3 and 6, by making outer slabs 4 shorter than the inner slabs so that at least one end of each outer slab is offset inwardly of the ends of the intervening supporting members to provide an open area 24. This area is large enough to permit connecting plates 26 (Fig. 3) to be inserted between the inner and outer slabs and bolted or otherwise rigidly connected to the adjoining ends of supporting members 7. Such a connection is especially desirable when the panel units meet between framework channels 3.

After members 7 have been secured together in this way, open area 24 is closed by a filler block 27 (Figs. 1 and 3) which may likewise be formed of a number of boards connected face to face. Preferably, the outer and middle boards of outer slab 4 are shorter than the innermost board of that slab so that the ends of the former two boards are spaced inwardly from the ends of the innermost board. The filler block, as shown in Fig. 3, is of a shape adapted to fit into the irregular open area thus formed where it can be nailed to the underlying supporting members or cemented to the projecting ends of the inner boards. With the closing of the spaces between the ends of the outer slabs, the outer surface of the panels becomes continuous.

A wall or roofing structure constructed in accordance with this invention can be quickly erected because it is formed of panel units and because they can be readily connected to the underlying framework members by clips. The clips form a secure connection and can not work loose. Furthermore, the clips do not interrupt the smooth outer surface of the structure because they are entirely concealed within the panel units. The panel units are securely connected together at their ends by joining their supporting members after the units have been secured in place. These end connections can be made without breaking the outer surface of the structure because filler blocks are used to fill the spaces through which the workmen made the end connections. With tongue and groove joints at the sides of the panel units, the result is a very strong and rigid structure both sides of which have continuous surfaces throughout their area.

According to the provisions of the patent statutes, I have explained the principle and construction of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. A structural panel unit comprising an elongate supporting member and a pair of slabs spaced apart by said member and secured thereto, said member projecting outwardly beyond one of the slabs.

2. A structural panel unit comprising an elongate supporting member, a slab secured to one side of said member and extending from end to end thereof, and a slab secured to the opposite side of said member with its ends spaced inwardly from the ends of said member.

3. A structural panel unit comprising a pair of channel members having their webs connected together with openings extending transversely between them, a slab disposed against the channel flanges at one side of said members, a slab disposed against the channel flanges at the opposite side of said members with an end spaced inwardly from the adjacent end of the channel members, and fastening members disposed in said openings and connecting said slabs to the adjoining channel members.

4. A structural panel unit comprising a pair of channel members having their webs connected together, said webs being provided with transverse corrugations to form openings between them, a slab disposed against the channel flanges and extending from end to end thereof, a slab disposed against the opposite channel flanges with its ends spaced inwardly from the ends thereof, and fastening members disposed in said openings and connecting said slabs to the adjoining channel members.

5. A structural panel unit comprising an elongate supporting member and a pair of slabs spaced apart by said member and secured thereto with the ends of one only of said slabs offset inwardly of the ends of said member, each slab being in the form of a plurality of boards connected face to face.

6. A structural panel unit comprising an elongate supporting member and a plurality of paper-faced plaster boards cemented face to face and secured against opposite sides of said member, the boards on one side of said member being offset inwardly of the ends of the member.

7. A structural panel unit comprising an elongate supporting member and a pair of slabs spaced apart by said member and secured thereto with the ends of one only of said slabs offset inwardly of the ends of said member, each slab being in the form of a plurality of boards connected face to face with one of the boards of one slab offset laterally.

8. A structural panel unit comprising a pair of channel members having their webs connected together, said webs being provided with transverse corrugations to form openings between them, a slab disposed against the channel flanges and extending from end to end thereof, a slab disposed against the opposite channel flanges with its ends spaced inwardly from the ends thereof, each slab being in the form of a plurality of paper-faced plaster boards cemented face to face, the flange-engaging board of each

slab being nailed to said channel members with the nails projecting into said openings.

9. A plurality of structural panel units disposed end to end and each comprising an elongate supporting member and a pair of slabs spaced apart by said member and secured thereto, said member projecting outwardly beyond one of the slabs to space it from the end of the adjacent slab of the adjoining panel unit whereby to give access to the outwardly projecting portion of said member.

10. In a building, a substructure, a plurality of panel units disposed end to end in adjoining rows against the substructure, each of said units comprising an elongate supporting member and a slab secured to one side of said member extending from end to end thereof and a shorter slab secured to the opposite side of said member with its ends spaced inwardly from the ends thereof; means for connecting said member to the supporting member of the adjoining panel unit in that row, and a filler block disposed between the ends of adjacent short slabs for filling the space between them.

11. In a building structure, a plurality of spaced parallel framework members, a plurality of panel units disposed end to end across said members in adjoining rows, each of said units comprising an elongate supporting member and a slab secured to one side of the supporting member extending from end to end thereof and a shorter slab secured to the opposite side of said supporting member with its ends spaced inwardly from the ends thereof; means for connecting said supporting member to the supporting member

in the adjoining panel unit in that row, a filler block disposed between the ends of adjacent short slabs for filling the space between them, one of said slabs being provided in its side with a slot adjacent one of said underlying framework members, and a clip in said slot and having portions overlying said notched slab and connected to said underlying framework member.

12. In a building structure, an elongate framework member having a flange, a panel unit disposed against said flange transversely thereof and comprising an elongate supporting member having oppositely disposed flanges and a slab secured to each of said last-mentioned flanges; the slab engaging said framework member flange being provided in its side edge with a transverse slot adjacent said flange, and a channel-like clip having its web disposed in said slot and its flanges engaging said notched slab and framework flange between them, the inner end of said web being notched to receive the adjoining supporting member flange.

13. In a building structure, an elongate framework member having a flange, a plurality of slabs disposed side by side across said flange, each slab being provided in one side edge with a transverse slot adjacent said flange, and a channel-like clip having its web disposed entirely in said slot with its flanges engaging said notched slab and framework flange between them, the slab-engaging clip flange extending outwardly over the edge portion of the adjoining slab.

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