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STRUCTURAL PANELS

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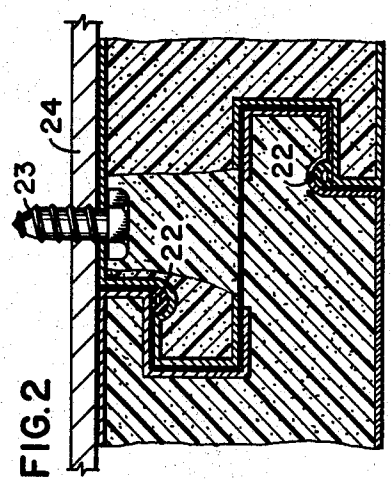

FIG. 2

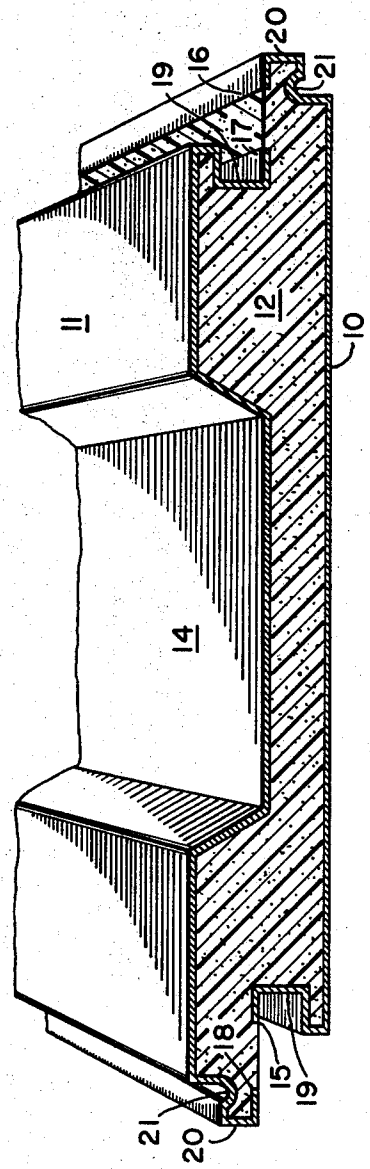

FIG. 1

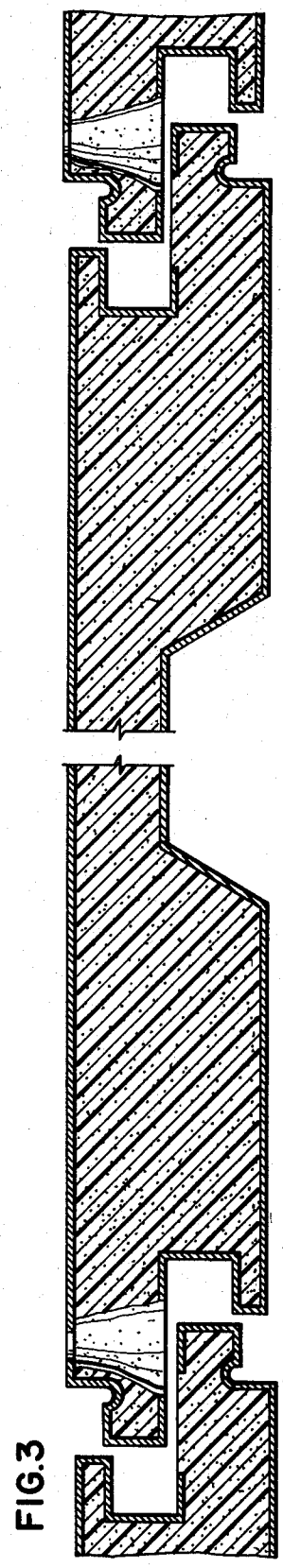

FIG. 3

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STRUCTURAL PANELS

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Int. Cl. E04c 2/13, 2/26

U.S. Cl. 52—595 5 Claims

ABSTRACT OF THE DISCLOSURE

A structural panel forming member and a panel are provided; the panel forming member is made up of a continuous sheet of material of uniform thickness having an outer face forming an exposed wall surface and an opposite inner surface, opposite first and second side edges and opposite first and second end edges, said first side edge being bent to form a groove-like recess spaced from the outer face, the second side edge being bent to form a tongue spaced from the outer face and adapted to fit within the groovelike recess; the panel is formed by a pair of spaced apart panel forming members with an insulant therebetween.

This invention is a continuation-in-part of my copending application Ser. No. 425,544, filed Jan. 14, 1965, now abandoned.

This invention relates to structural panels and particularly to composite laminate insulated structural panels having inner and outer surfaces or skins, at least the outer one of which is inter-connected by side and end laps and to the novel skin sheets used in forming such laminates or as structural panels in their own right.

In the building and similar trades there has long been a need for a structural panel having a satisfactory weatherproof joint with the next adjacent panel and preferably including spaced apart panels having an insulant therebetween. The common practice in assembling metal panel buildings is to erect the girts and purlins forming the framework of the building and then to first fasten an inner sheet to the assembled girts and purlins, then to fasten an insulation sheet to the inner sheet and finally to fasten an outer sheet through the insulation to the inner sheet and the girts and purlins of the frame. This practice is expensive and time-consuming involving three times as much time and effort as installing a single sheet to the girts and purlins of a building.

I have invented a structural panel which eliminates the problems of prior art three step practices described above and which makes it possible to install a superior panel wall or roof in a single step while providing improved weather sealing and insulating effectiveness. In a preferred embodiment of my invention, I provide a panel forming member and a composite structural panel formed of two such panel forming members and a formed in situ foamed insulant which is self-adhered to the panel forming sheets to form a unitary composite structure. Alternatively, I may place cement asbestos, fiberglass or any other insulating and/or fireproof material within the area between said sheets.

Preferably, I provide a panel forming member comprising a continuous sheet of material of substantially uniform thickness formed to provide an outer face adapted to form an exposed wall surface and an inner opposite face, opposite first and second side edges and opposite first and second end edges, said first side edge being bent to form a groove-like recess spaced from the outer face and extending the length of the panel, the second side edge being bent to form a tongue spaced from

the outer face and adapted to fit within the groove-like recess of the first edge. Preferably, an insulated panel is formed by spacing two much members apart with the inner faces toward one another and the first side edge of one adjacent the second side edge of the other to form a box-like configuration into which an insulant is formed in situ between and adhering to the inner faces of the two panel forming members. Preferably, the two members are spaced so the first end edge of each extends beyond the insulant to form an overlapping edge for assembly of panels end to end. Preferably at least one of the tongue and the groove is provided with a sealant slot extending its full length into which a resilient sealant is placed during assembly of adjacent side-by-side members or panels as the case may be. The members used in forming an insulated panel are preferably spaced apart at the side edges so as to eliminate any continuous contact between the two and thereby prevent heat exchange from one to the other and providing an area for insertion of a fastener which forms a blind fastener to the exterior face. Preferably the insulant is urethane foam formed in situ between the inner and outer sheets.

In the foregoing general description I have set out certain objects, purposes and advantages of my invention. Other objects, purposes and advantages of my invention will be apparent from a consideration of the following description and the accompanying drawings in which:

FIG. 1 is a fragmentary isometric view of a panel according to my invention;

FIG. 2 is a fragmentary section of a joint between two adjacent panels according to FIG. 1 showing the fastening to a building girt;

FIG. 3 is a section broken away of three adjacent panel fragments and their respective positions for joining;

I have illustrated in the foregoing drawings various embodiments of panels according to my invention which I shall hereafter describe in detail.

In FIGS. 1 through 3 I have illustrated a preferred embodiment of my invention in which two panel forming members **10** and **11** are spaced apart by a foamed in situ urethane foam insultant **12**. The two panel forming members **10** and **11** have outer faces of different configurations, that of **10** being perfectly flat and planar, while that of **11** is generally planar but has a central valley or trough portion **14** for decorative as well as utilitarian drainage effect. While I have illustrated an outer skin having a trough it will be obvious that the skin may be flat or have any other configuration and that the inner and outer skins may be identical.

The side edges **15** and **16** of member **10** and **17** and **18** of member **11** are of like configurations. One side edge of each, **15** and **17** respectively, is bent to form a groove **19**. The second side edge of each, **16** and **18** respectively, is bent to form a box-like tongue **20** adapted to fit with groove **19**. The base of tongue **20** of each is provided with a sealant slot **21** adapted to receive a resilient sealing strip **22** which may be in the form of a hollow elastomer ring, a mastic or similar resilient or flowable sealant. Alternatively the sealant strip may take any of the forms shown in FIGS. 23 through 31 and 34 through 36, each of which will be discussed in more detail hereafter.

The two members **10** and **11** are assembled in spaced relation so that the bent side edges **15** and **16** and **17** and **18** are spaced apart and out of contact with one another and the area between the members is filled with foam or any insulating and/or fireproof material. Such insulated panels are assembled in a wall or roof by removing insulant from the gap between the side edges to form a well and inserting a screw fastener **23** or other suitable fastener through one member such as **10** in to a girt or purlin **24** as the case may be. The next panel is joined by forcing the tongues **20** into grooves **19** of the two panels and fastening

the new panel with screws **23** or other suitable fastener in the same manner as the first assembled panel as shown in FIG. 2 with the sealant **22** in place in slot **21**.

While I have illustrated and described certain preferred embodiments of my invention in the foregoing specification, it will be understood that this invention may be otherwise embodied within the scope of the following claims.

I claim:

1. A structural panel comprising a pair of spaced apart panel members, each of said panel members being in the form of a continuous sheet of material of substantially uniform thickness formed providing an outer face adapted to form an exposed wall surface and an inner opposite surface, opposite first and second side edges and opposite first and second end edges, said first side edge being bent downwardly forming a face transverse to the outer face, then inwardly parallel to said outer face, downwardly transverse to the face and outwardly parallel to said outer face forming a groove-like recess spaced from both the outer face and inner surface and extending the length of the panel, the second side edge being bent downwardly forming a face transverse to the outer face and parallel to the first side edge face, outwardly parallel to the outer face, down wardly transverse to the outer face and then inwardly parallel to the outer face forming a tongue spaced from the outer face and adapted to fit within the groove-like recess of the first edge and said end edges being adapted for abutting relationship, said panel members having their inner surfaces toward one another and the first side edge of one adjacent the said second side edge of the other forming a box like configuration containing an insultant between and adhering securely to the inner faces of the two panel forming members.

2. A structural panel as claimed in claim **1** wherein the tongue of one panel member is spaced from the groove of the other panel member forming an off set portion and fastening means are inserted between the spaced first and second side edges passing through said offset portion.

3. A structural panel as claimed in claim **1** wherein the insulant is a foamed insulant.

4. A structural panel as claimed in claim **1** wherein the tongue is provided with a sealant slot.

5. A structural panel as claimed in claim **4** wherein the slot is filled with a resilient member.

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