

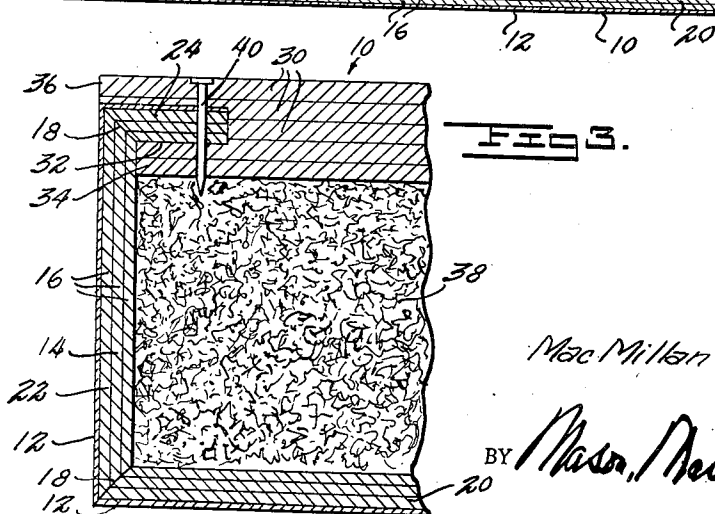
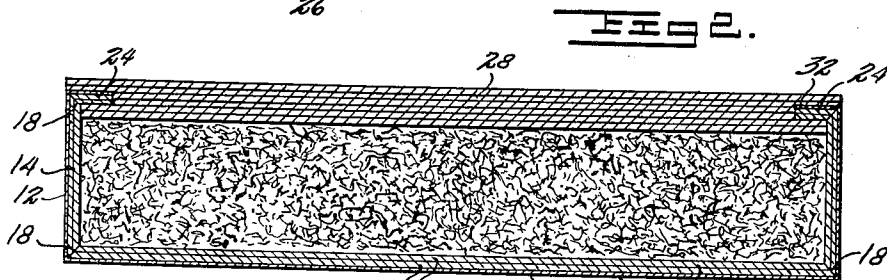
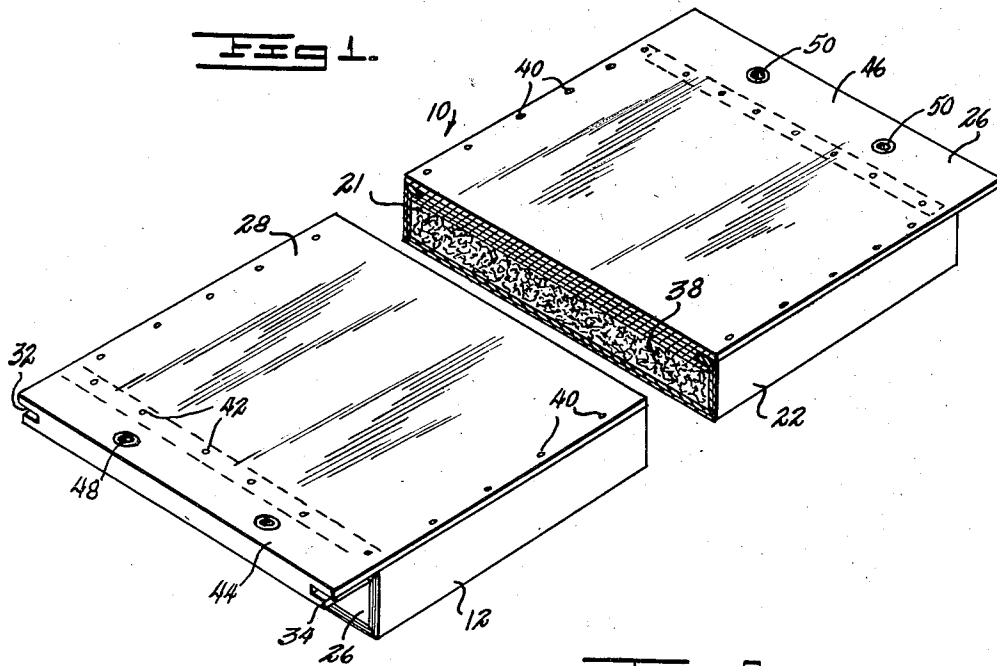
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PANEL

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2,834,064

PANEL

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3 Claims. (Cl. 20—4)

This invention relates to a structural panel for use in constructing buildings, refrigerator structures particularly of the "walk-in" type, refrigerator cars of railway rolling stock, and refrigerator trucks—especially the floors and ceilings of such buildings and refrigerator structures; and for all uses where such panels must contribute to the structural strength of the building. Such panel must also have a high co-efficient of thermal insulation. The invention relates to a panel which will permit shipment of the component parts thereof from a factory to an assembly area.

An object of the invention, therefore, is to provide a panel, the component parts of which may be shipped from the factory in flat or nested condition and assembled in the field; i. e., at the place of construction.

Another object of the invention is to provide a panel which is especially adapted for wall, floor, and ceiling constructions.

A further object of the invention is to provide a panel which is characterized by its thermal insulating qualities and which has improved logistic characteristics whereby it may be readily transported from place to place because of its lightness and rigidity and may be easily assembled and disassembled in accordance with the requirements of the armed services. Structures made from panels of this invention may be also easily disassembled and carried to another location and quickly reassembled by unskilled labor without injury to the individual panels because of their rugged construction.

Other objects of the invention will be set forth hereinafter throughout the specification.

In the drawings:

Figure 1 is a perspective view of the panel with parts shown in vertical section;

Figure 2 is a transverse vertical section of the panel; and

Figure 3 is an enlarged vertical section showing one side of the panel.

Panels of the type hereinafter described result in building and refrigerator structures of a pre-cut modular system of building structures which are equally effective in arctic, temperate, or tropical climates. Due to the experience gained in the designs of containers for smokeless powder, it has been possible to develop a flexible system of building construction composed of durable, light weight panels. Such panels as now to be described may be used to provide a basementless warm, dry floor system suitable for all climates. Such floors are proof against moisture-vapor and infestation.

Good insulation is desirable in all climates, but the ability to maintain insulating efficiency has been given very little consideration until lately, even in the commercial refrigeration industry. In the more northerly climates, the hazards of in-wall condensation, by virtue of moisture-vapor developed by normal household activities increases as the ambient outdoor temperatures go down, whereas in the more tropical climates, subjected to high external

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humidities and periods of heavy rainfall, a reversal of the direction of vapor pressure may be encountered, particularly in the presence of air conditioning of any form.

It is to be noted that the construction outlined has very low heat inertia, a factor of little importance in the more northerly climates, but of increasing importance in southern and tropical areas where it is desirable to rapidly dissipate latent heat accumulated during the day in the cooler night air.

Referring now to the drawings, the numeral 10 indicates generally the panel as a whole. A number of these panels may be arranged side-by-side to form the floor or ceiling of a building or refrigerator means. They may also be used to form the wall or roof of such constructions, but when so used, an outside skin or cover (not shown) is applied to the surface of the wall or roof.

Preferably, each panel is provided with a non-rustable metallic skin 12 of stainless steel, aluminum, copper, magnesium, Monel metal, or any other suitable material, but such sheet of skin is preferably of metallic material.

The skin forms part of the facing of the panel, and the undersurface thereof is bonded, preferably on its entire undersurface area, to the outer surface area of the inner non-metallic sheet of material 14. As shown, this non-metallic sheet of material may consist of a plywood sheet having a plurality of laminations or layers 16. This non-metallic sheet of material 14 is provided with a plurality of V-notches 18 which extend longitudinally of the panel and which, when the panel is assembled at the assembly area, upon folding of the skin 12 and sheet 14 to which it is bonded, provides a base 20, sides 22, and locking flanges 24.

In the preferred construction, the skin 12 extends over the entire outside area of the non-metallic sheet 14 so that the skin forms part of the flange 24 as seen particularly in Figures 2 and 3.

When the panel is assembled, which assembly may take place either at the factory or at the place of erection of the building or refrigerator structure, end pieces 26, only one of which is shown, may be used. This may consist of plywood similar to the sheet 14 or if a heavier construction is needed, a frame member may be used similar to the frame member 42 shown in my Patent No. 2,629,140, February 24, 1953.

The top member is provided with extension means 44 and 46 as shown in Figure 1. This extension means, when the panel is assembled, overhangs the sides, base, and ends of the panel at each end thereof and is intended to perform the same function as the extension means shown at 31 and 43 in my patent supra. The extension means need only be used at one end of the panels, in which case the opposite end of the panel will terminate at the end piece. Metal-lined apertures 48 and 50 may optionally be used. These extend through each extension means for the reception of lag screws or other securing means, whereby the panel may be attached to suitable supports, such as runners or the framework of the building or refrigerator structure. Where the panels are used for a floor or ceiling, the apertures 48 may not be used and the surface of the extension means may be plain.

A cover or top member 28 is provided for each panel. This may consist of plywood as shown, in which the several laminations 30 are preferably thicker than the laminations of the sides and base of the panel. Extending longitudinally of the top members are rabbeted side edges 32. It will be noted that these side edges have lower portions 34 which are shorter than the upper portions 36 to allow for the thickness of the sides 22 as shown in Figure 3. The interior of the panel is filled with insulation material 38.

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The locking flanges are retained in place within the rabbeted side edges by suitable securing means such as nails 40, and the end pieces 26 may be retained in place by the nails 42.

It will be understood that the non-metallic sheet of material 14 with the metallic skin 12 bonded thereto, the said sheet having V-notches therein may be shipped in flat condition, together with the insulation material 38, the end pieces 26, and the cover or top member 28 having the rabbeted edges 32 to the place of erection of the building, refrigerating means, and there assembled to form the completed panels, after which the panels are utilized in the construction of the building or refrigerator means. The skin 22 is bonded over its entire surface area on one side thereof to the non-metallic sheet, and this sheet may be a plywood sheet or a sheet of other fibrous material, such as hardboard, etc. The top members, laminated skin and non-metallic sheet, as attached to each other, the end pieces and insulation material may be shipped in separate containers or crates to the staging area and there made into the panels of this invention. Each panel is made by turning over the sides 22 and the locking flanges 24 and inserting these locking flanges in the rabbeted sides of the top member. Once the top, sides, and base have been assembled, the ends 26 are put in place. These elements may then be nailed to each other by nails 40 and 42. The insulation can be added at any time prior to the placing of the top member or either end piece in position.

The term "refrigerators" or "refrigerating means" in the claims includes all types of refrigerators, and particularly refrigerators of the "walk-in" type and refrigerator cars and trucks; and the term "building constructions" includes all types of buildings, such as aircraft hangars, houses, and food locker plants.

Certain mechanical expressions of the inventive idea involved are shown in the accompanying drawings and specific language has been used in the specification. These are designed merely as illustrations to assist in the description of the invention and not as defining the limits thereof.

I claim:

1. A panel for use in building construction and refrigerators comprising in combination, a metallic sheet and a non-metallic sheet of material, said sheets being bonded to each other and fashioned to define a U-shaped open-ended metal covered assembly having a base, sides and turned-over flanges, a cover, means for attaching said cover to said locking flanges, said means including rabbeted side edges on said cover for the reception of said locking flanges, the said cover and the said metallic and

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non-metallic bonded sheets defining a space, insulating material in said space, said cover extending beyond the ends of said assembly.

2. A panel for use in building construction and refrigerators comprising in combination, a metallic sheet and a non-metallic sheet of material, said sheets being bonded to each other and fashioned to define a U-shaped open-ended metal covered assembly having a base, sides and turned-over flanges, a non-metallic cover, means for attaching said cover to said locking flanges, said means including rabbeted side edges on said cover for the reception of said locking flanges, said means further including a plurality of nails extending through said rabbeted side edges and through said locking flanges, said cover and said bonded sheets defining a space, insulating material in said space, said cover extending beyond the ends of said assembly.

3. A panel for use in building construction and refrigerators comprising in combination, a metallic sheet and a non-metallic sheet of material, said sheets being bonded to each other and fashioned to define a U-shaped open-ended metal covered assembly having a base, sides and turned-over flanges, a cover, means for attaching said cover to said locking flanges, said means including rabbeted side edges on said cover for the reception of said locking flanges, said means further including a plurality of nails extending through said rabbeted side edges and through said locking flanges, said locking flanges comprising portions of said metallic and non-metallic sheets of material, said panel having end pieces, and fastening means extending through said top member and said end pieces comprising nails, said cover being of non-metallic character and extending beyond the ends of said assembly.

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