Dec. 16, 1958 MacMILLAN CLEMENTS 2,864,132

PANEL CONSTRUCTION

Filed April 16, 1953

Fig 1.

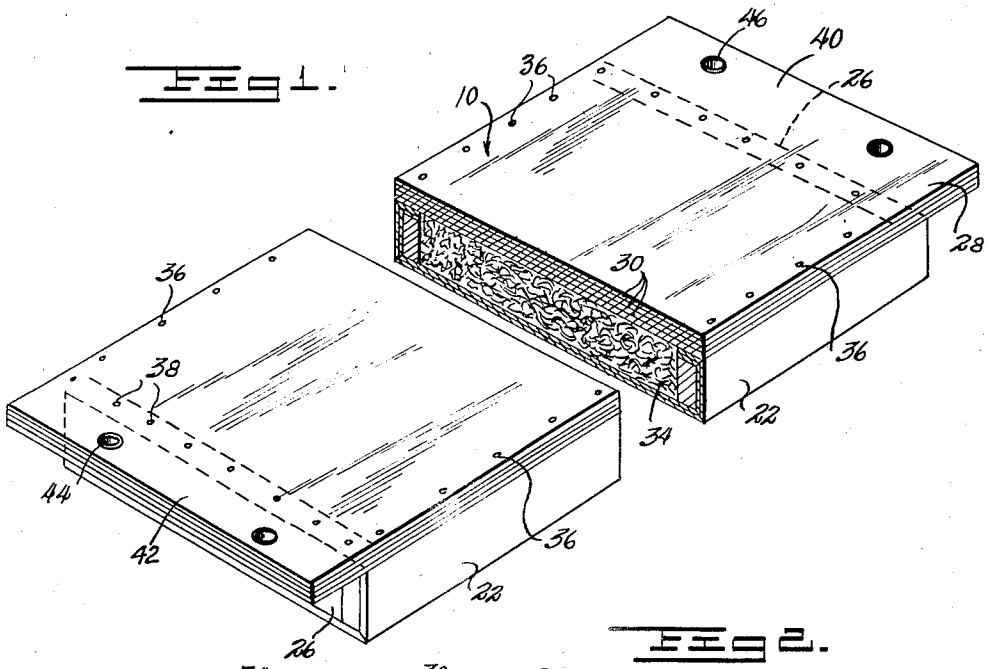


Fig 2.

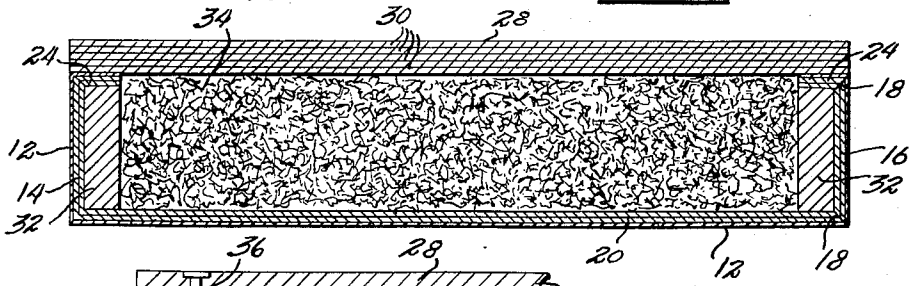
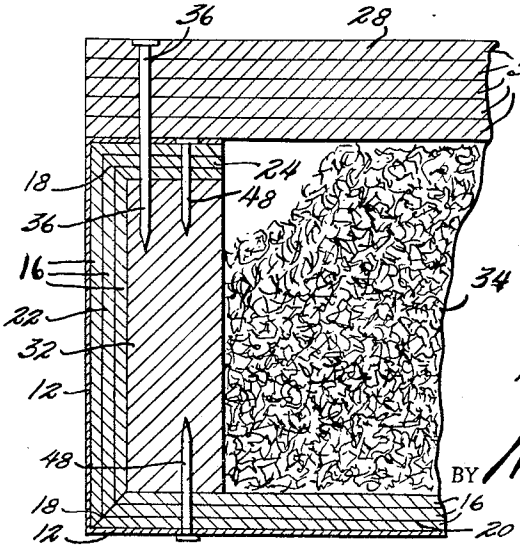


Fig 3.



INVENTOR

MacMillan Clements

BY Mason, Mason & Sturidge

ATTORNEYS

United States Patent Office 2,864,132 Patented Dec. 16, 1958

2,864,132

PANEL CONSTRUCTION

MacMillan Clements, Bethel, Conn.

Application April 16, 1953, Serial No. 349,209

1 Claim. (Cl. 20—15)

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. The invention incorporates substantially all of the improved features of insulation that includes low cost, light weight, strength, dimensional stability, thermal insulating, long lasting, rodent-proof panel that is intended for use in forming the floors, ceiling, walls, or roofs of buildings, refrigerators and which may be used in all such construction where heat insulating qualities are desired. The invention incorporates certain qualities and improvements that have been set forth in the patent granted to me No. 2,629,140, February 24, 1953.

A particular object of the invention is to provide a building panel which embodies increased rigidity and load-sustaining qualities.

A further object of the invention is to provide a panel which is characterized by its thermal insulating heat dissipating and vapor barrier characteristics and which has improved logistic qualities whereby it may be readily transported from place to place because of its lightness and rigidity and may be easily assembled and disassembled at the staging site, without injury to the panels of this invention, to thereby provide knock-down houses, aircraft hangars and refrigerator structures for food storage, etc.

Other objects will appear hereinafter thoughout 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 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 to the several figures of the drawings, the numeral **10** indicates generally the panel as an entirely. The sides and base are covered by a metallic skin or sheet **12** which is bonded to the non-metallic sheet **14**, which latter preferably consists of a plurality of laminated fibrous sheets **16**. These fibrous sheets are bonded to each other, and the outermost sheet is bonded to the metallic skin over the entire contacting areas of the sheets.

A plurality of V-notches **18** are cut in the non-metallic sheet, and the sheet is folded to form a base **20**, sides **22**, and locking flanges **24**. End pieces **26** are provided, and a cover or top member **28** is attached to the locking flanges and the end pieces by suitable fastening means such as nails **36** and **38**, respectively. The top member is provided with a plurality of laminations **30** which are bonded to each other so that the top consists of a plywood sheet. The thickness of the individual sheets **30** is preferably less than the thickness of the sheets **16** forming the laminations of the base and sides, as shown in Figure 3.

The base, sides, and locking flanges enclose three sides of the reinforcing longitudinal members **32**, and the top member, sides, base, and ends form an enclosed space in which is located suitable insulating material **34** such as Fiberglas. As will be noted by reference to Figure 3, the reinforcing longitudinal members **32** are held in place by a number of spaced attaching means such as nails **48**, and the top member is held in place by other attaching members such as nails **36** that extend through the top, overlapping flanges **24** and into the reinforcing longitudinal members **32**. The end pieces **26** are attached to the top member **28** by spaced holding means such as nails **38**.

As shown in Figure 1, the panel top member may be provided with extension means **40** and **42** at each end thereof, although under some conditions either or both extension means can be dispensed with. Each of these extension means overhangs and extends beyond the ends of the panel as defined by the end pieces, base, sides, overhanging flanges, and the reinforcing longitudinal members. The extension means may each be provided with attaching means such as metal-lined apertures **44** and **46** for the reception of lag screws or other securing means that may be attached to a suitable support or part of the building framework, but such metal-lined apertures may be omitted, particularly where the panel forms part of a floor or ceiling. The end pieces **26** may be of plywood, or they may be of heavier and stronger material similar to the members **32**.

The term "refrigerators" or "refrigerating means" in the claim includes all types of refrigerators, and particularly refrigerators of the walk-in type, refrigerated cars and trucks; and the term "building constructions" includes all types of buildings, particularly houses and 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:

A panel for use in building construction and refrigerators comprising in combination, a laminated sheet including an outer metallic layer and an inner non-metallic layer bonded together throughout their contacting surfaces and arranged to form a base, two parallel sides at right angles to said base, and an inwardly extending overhanging flange at the upper edge of each side; said flanges being parallel to said base to form a substantially U-shaped channel along each side of said panel, a reinforcing member located in and substantially filling each of said channels and having its ends flush with the ends of the respective channel, an end piece separate from said sheet extending between and having its outer side face flush with the adjacent end faces of said reinforcing members at each end of the panel, means for securing said flanges to said reinforcing members, a wooden cover of uniform thickness mounted on said flanges and said end pieces to form an enclosed space, insulating material in said space, means for securing said cover to said flanges and said end pieces, the edges of said cover being flush with said sides, and the ends thereof extending beyond said end pieces to form attaching portions.

References Cited in the file of this patent

UNITED STATES PATENTS

1,666,258	Hammond	Apr. 17, 1928
1,683,966	Forster	Sept. 11, 1928
2,018,712	Elmendorf	Oct. 29, 1935
2,216,206	McGee	Oct. 1, 1940
2,271,355	Sweet	Jan. 27, 1942
2,426,802	Wachsmann	Sept. 2, 1947
2,557,412	Clements	June 19, 1951
2,585,557	Kreimendahl	Feb. 12, 1952
2,585,961	Norquist	Feb. 19, 1952