Feb. 25, 1964 S. BERSUDSKY 3,121,977

BUILDING PANEL STRUCTURE

Filed Feb. 8, 1956 4 Sheets-Sheet 1

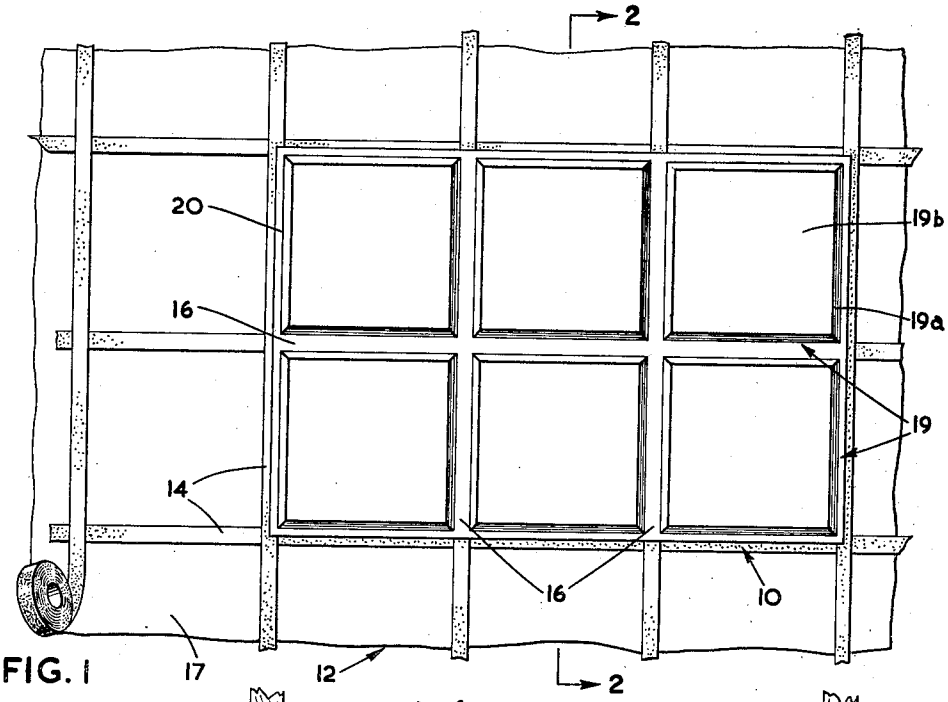


FIG. 1

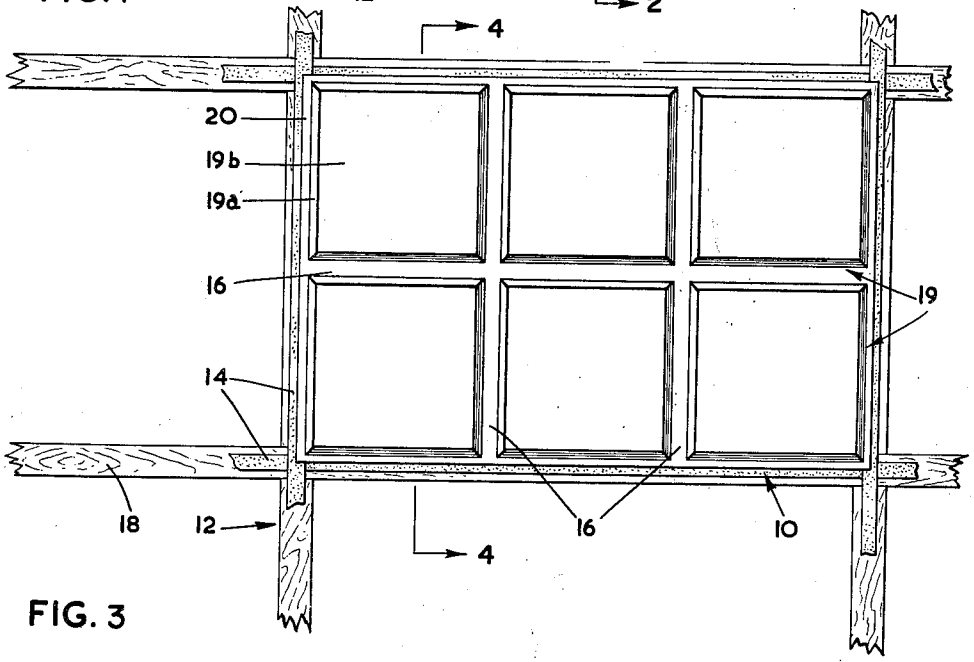


FIG. 3

Inventor
SIDNEY BERSUDSKY
By: Maybee & Legris
Att'ys

Feb. 25, 1964 S. BERSUDSKY 3,121,977

BUILDING PANEL STRUCTURE

Filed Feb. 8, 1956 4 Sheets-Sheet 2

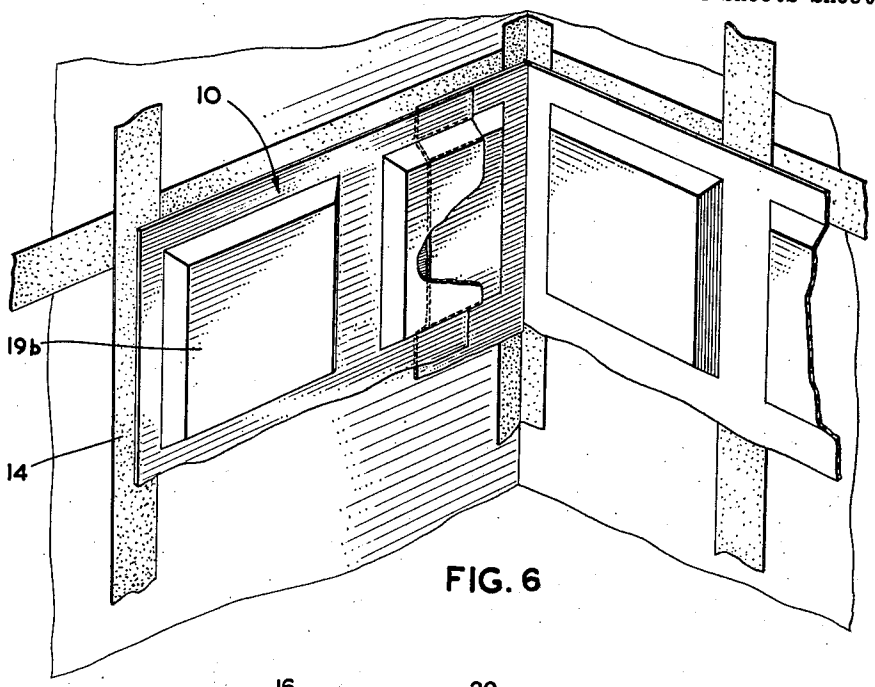


FIG. 6

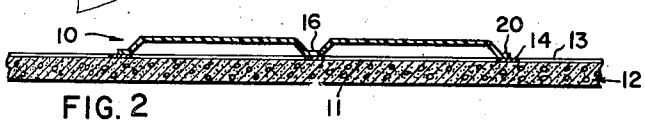


FIG. 2

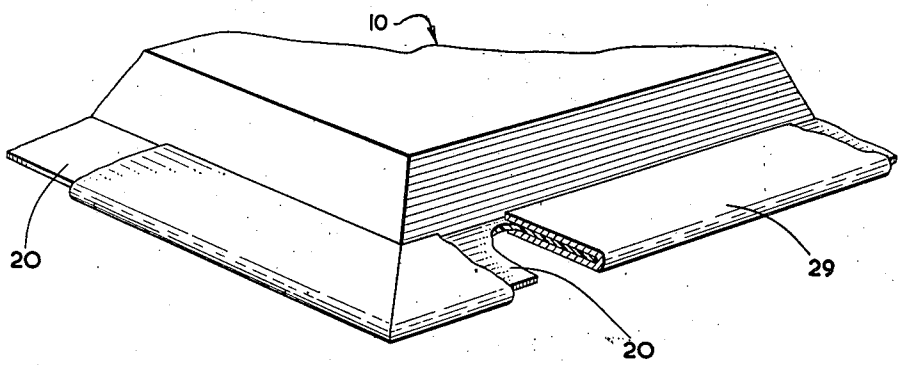


FIG. 11

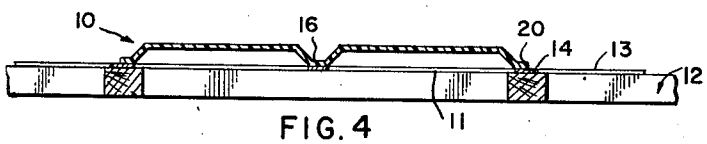


FIG. 4

Inventor
SIDNEY BERSUDSKY

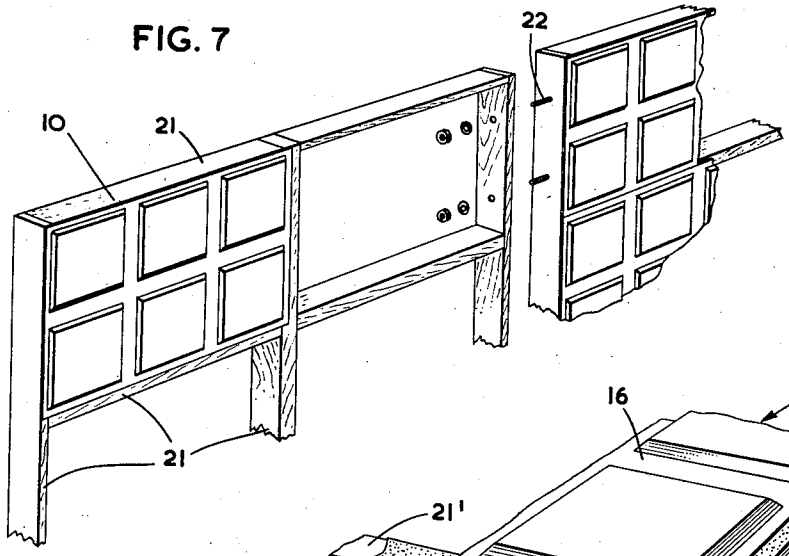
By: Maybee & Legris
Att'ys

Feb. 25, 1964 S. BERSUDSKY 3,121,977

BUILDING PANEL STRUCTURE

Filed Feb. 8, 1956 4 Sheets-Sheet 3

FIG. 7



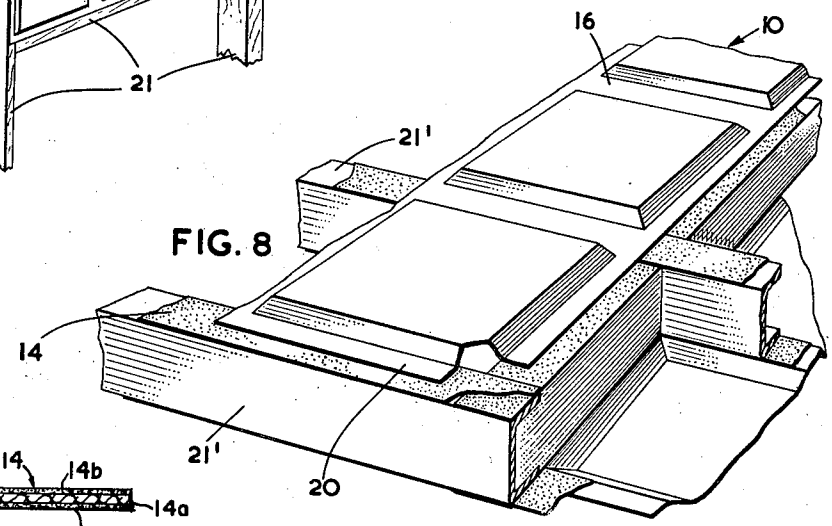


FIG. 8

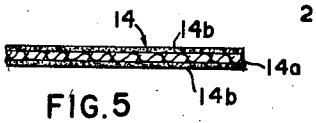


FIG. 5

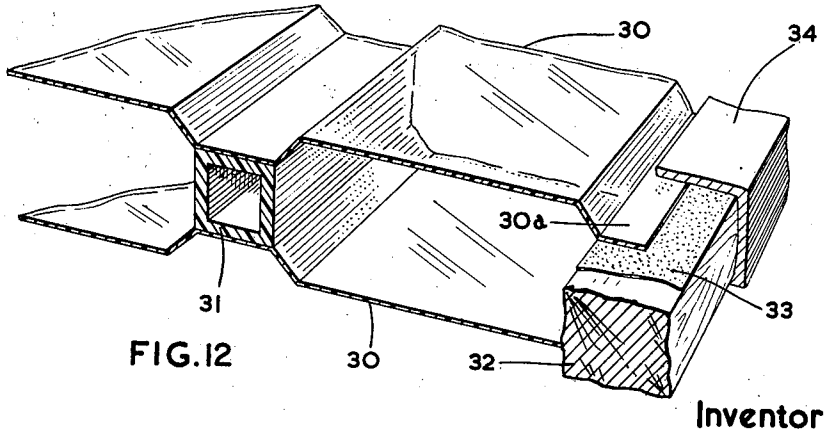


FIG. 12

Inventor
SIDNEY BERSUDSKY
By: Maybee & Legris
Att'ys

Feb. 25, 1964 S. BERSUDSKY 3,121,977

BUILDING PANEL STRUCTURE

Filed Feb. 8, 1956 4 Sheets-Sheet 4

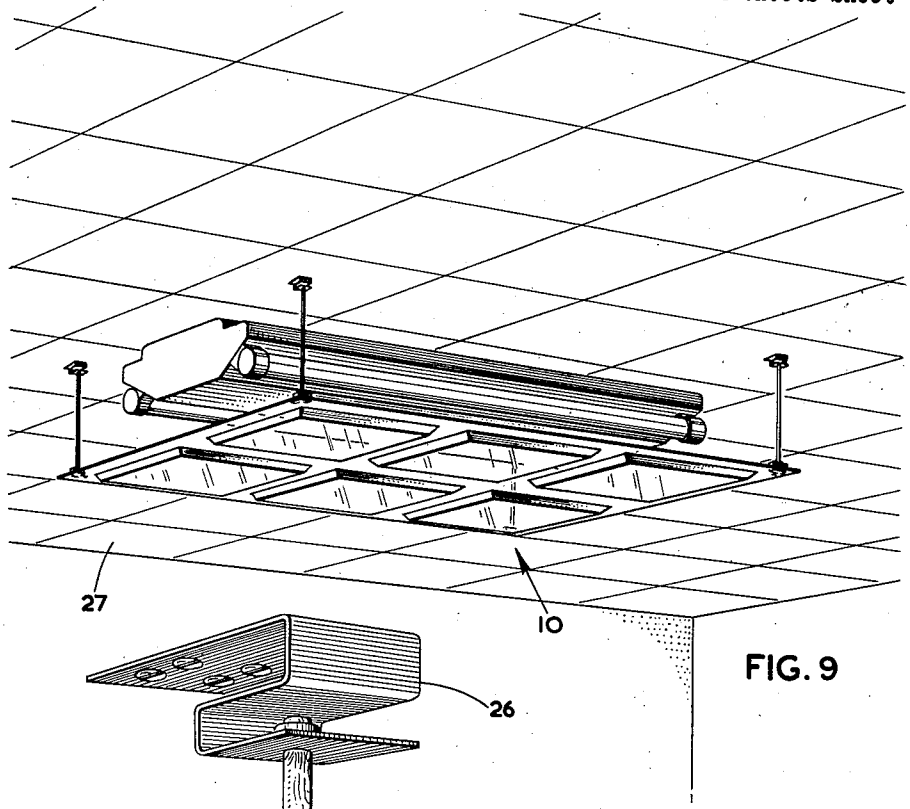


FIG. 9

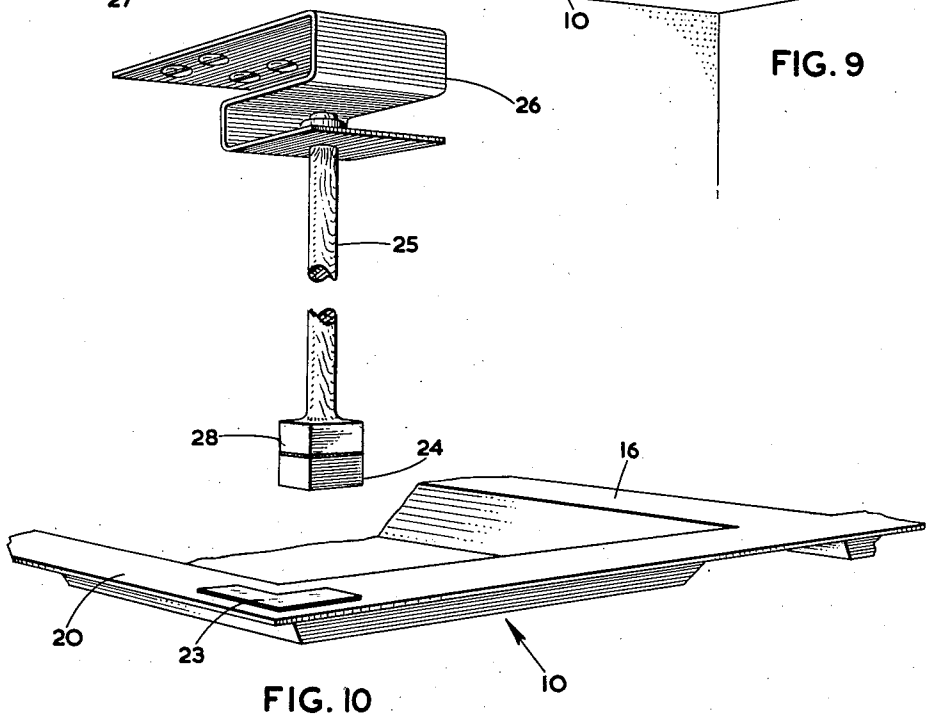


FIG. 10

Inventor
SIDNEY BERSUDSKY
By: Maybee & Legris
Att'ys

United States Patent Office 3,121,977 Patented Feb. 25, 1964

3,121,977

BUILDING PANEL STRUCTURE

Sidney Bersudsky, 46 Avenue Road, Toronto, Ontario, Canada

Filed Feb. 8, 1956, Ser. No. 564,272
1 Claim. (Cl. 50—271)

This invention relates to a building panel for surfacing or enclosing building structures and members, such as wall, ceiling and partition structures, and framed members like doors and windows.

An object of this invention is to provide a building panel that can be conveniently and easily applied by unskilled persons and that will be inexpensive to produce and to market.

Other objects are to provide a building panel of this kind that can be cheaply made of plastic, that will nest with similar panels for compactness in packaging, and that can be joined to other panels on a supporting structure in such a way as to disguise the joints.

A further object of the invention is to provide a building panel structure that will conveniently enclose and surface supporting structures that are in the form of open lattices or grids and that will be self-supporting across the openings in the supporting structure.

These objects are attained by the embodiments of the invention disclosed in the following description and the accompanying drawings, which relate to panel structures in the form of self-supporting webs of sheet material having one or more supporting surfaces lying in one plane and adhered to supporting structures also having one or more surfaces in one plane.

In the drawings—in which each reference character is used to indicate the same part in the various views—

FIG. 1 is a front elevation of a building panel structure according to the invention.

FIG. 2 is a section on the line 6—6 in FIG. 1.

FIG. 3 is a front elevation of a building panel structure according to the invention on a different kind of supporting structure.

FIG. 4 is a section on the line 8—8 in FIG. 3.

FIG. 5 is a vertical cross-section of a section of the adhesive tape used according to the invention.

FIG. 6 is a perspective view showing two parts of a single panel joined together.

FIG. 7 is a perspective view of a partition constructed according to the invention.

FIG. 8 is a fragmentary perspective view of another kind of building panel structure according to the invention.

FIG. 9 is a perspective view of another kind of structure suitable for use as a luminous ceiling.

FIG. 10 is an enlarged perspective view of a hangar as shown in FIG. 9.

FIG. 11 is a perspective view of an arrangement for framing panels according to the invention, and

FIG. 12 is a fragmentary perspective view of a door or window unit using the building panel structure of the invention.

The building panel structure generally comprises a panel 10 having a flat supporting surface 11 overlying a supporting structure 12 having a flat surface 13, with adhesive means 14 between the flat surfaces of the panel and of the supporting structure to secure them together. The flat surface 11 on the panel is preferably made up of narrow intersecting bands 16 lying in one plane and forming a continuous rectangular network, as shown in FIGS. 1, 2, 3 and 4, surrounding offset areas of the web projecting out of the said plane on one side of the supporting surface. The flat supporting surface 13 of the supporting structure 12 may be a single continuous surface 17 as shown in FIG. 1 or it may be made up of the faces

16 of the intersecting structural members of a network as shown in FIG. 3.

The adhesive means 14 is preferably flexible tape consisting, as shown in FIG. 5, of a support or web 14^a having an adhesive 14^b on both sides so that it can be applied in straight narrow bands that are about as wide as the flat bands 16 of the panel 10. In particular cases, it may be desirable to apply the tape in small pieces, say at the corners of the panels rather than in long strips. This has a further advantage in that the panels will then be easily demountable.

In the preferred form of the invention, as shown in FIGS. 1, 2, 3 and 4, the panel 10 has flat-topped square tile units 19 in relief, separated by the straight intersecting flat bands 16 that form the rectangular network lying in one plane. The tile units are raised above the plane of the network sufficiently to provide adequate modelling by light; and the side walls 19^a of the tile units are preferably inclined at an angle of about 45° to the surface of the panel to facilitate nesting of the panels. The flat top surfaces 19^b of the tile units may be about 5" square, and these surfaces are preferably raised about ¼" above the plane of the flat bands 16. The width of the bands 16 between the tile units may be about ½", which provides a total spacing of 1" between the square top surfaces 19^b. The sheet material is bent in the forming with a $\frac{1}{16}$" radius at all corners.

Each panel may contain any convenient number of tile units. At the edges of the panel, the flat bands 16 are bisected so as to provide an outer margin 20 one-half as wide as the bands 16 between the tile units and the edges of the panel. Therefore, when two panels having ½" bands between the tile units are placed side by side, if the margins of the two panels are ¼", for instance, they will give the same total width of ½" that characterizes the bands, thus tending to conceal the joints between adjacent panels.

The panels may be made from a variety of materials that will provide a substantially self-supporting web. The preferred material is plastic: in order of preference, vinyl, modified (high-impact strength) polystyrene, and acrylic. They may also be stamped from sheet metal, either individually or in a continuous strip. If made from plastic, they can be made from injection or compression molding, but they are preferably vacuum-formed. Ideally, they can be made by vacuum-forming an extruded sheet before it has cooled, thus avoiding the need for heating the sheet to soften it.

Because the panels may be very thin, of the order of one-hundredth of an inch, they can be cut easily to fit particular areas. If the cut can be made between the tile-units of the preferred form of the invention, the joint will be disguised as effectively as it is between panels, if the cut is accurately made. If the cut is made across the tile-units, the thinness of the sheets enables adjacent edges to be overlapped without producing an unduly noticeable joint, as shown in FIG. 6, thus avoiding the need for accurate cutting.

The panel structure shown in FIGS. 2 and 4, in which the supporting structure is a network of intersecting structural members, lends itself to the construction of inexpensive portable and temporary partitions as shown in FIG. 10.

The partitions are constructed of right angled structural members 21 to form partition sections, which are joined by fastening means such as screws 22 and surfaced by panels 10 as already described. Such partitions have the virtue of economy, lightness and easy demountability. The structural members may be of any suitable material, such as wood as shown in FIG. 7, or metal or plastic channel-members 21' as shown in FIG. 8, and the panels may be opaque, translucent or transparent.

Similar structural arrangements may be used to provide ceiling surfaces. If translucent panels are used, lighting units mounted above the panel structure can be used to produce luminous ceilings. Various arrangements may be used to enable the panels to be removed for convenient access to the lighting units; the simplest way is to use small pieces of double-faced adhesive tape at the corners of the panels as already mentioned.

Another suitable way of providing a demountable panel structure is by using small permanent magnets as shown in FIGS. 9 and 10: a flat metal contact member **23** of magnetic material is secured to each corner of a panel with double-faced adhesive tape, and a registering magnet **24** is secured by means of a hanger rod **25** and a clamp **26** to the underside of the supporting structure **27** that forms the frame for the ceiling. An insulating block **28** connected to the rod **25** and adhered to the magnet with a suitable adhesive, for instance, may be used to join the magnet to the rod. The metal contact members **23**, with magnets, hangar rods, and clamps, may be regarded as parts of the supporting structure, arranged to present a surface on the underside of the contact member for adhesive attachment to the supporting surfaces of the panel in the same way as already described, but with a demountable magnetic connetcion between the surface of the supporting structure and of the building. Each magnet may register with one of the contact members **23**, as shown, or a larger magnet may be used, engaging contact members on two or more adjacent panels.

For greater rigidity the contact members **23** may be adhered to a panel structure as shown in FIG. 8, in which the channel members **21'** are preferably made of a light metal or of plastic and are secured to the panels with double-faced adhesive tape, while the metal contact members are adhered or otherwise secured to the supporting structure instead of to the panels themselves; if magnetic material is used for the channel members, the contact members are, of course, not needed.

If desired, a metal frame **29** may be crimped over the edges of the panel for strength, as shown in FIG. 11. The strengthened panel may be used in the same way as the standard panel, and lends itself to suspension by magnets if the frame is made of a magnetic metal.

Self-supporting door and window units may be made from two tile-shaped sheets **30** placed back to back, and transparent in the case of windows. The supporting surfaces of the two sheets may be adhered directly to each other or, as shown in FIG. 12, to opposite sides of inner and outer strengthening frame members **31** and **32** by a suitable adhesive or by heat-sealing, depending on the materials used and other circumstances. The inner strengthening frame members **31** for the windows, which may be made by injection or compression molding from acrylic or vinyl plastic or from polystyrene, may be transparent and of square tubular form, as shown in FIG. 12, or they may be channel-section members of the kind shown in FIG. 8. They are preferably of the same width as the flat supporting surfaces between the tile units. The outer frame members **32** for the windows, as shown in FIG. 12, may be of wood or other suitable material and are coated with a suitable adhesive **33** to adhere the panel

margins to them. The margins 30^a of the transparent sheets may be securely held, and a finished appearance achieved, by enclosing the outer edges in a U-shaped channel member **34**.

When the panels are used according to the invention to provide ceiling structures, they can be used below conventional sprinkler system installations without interfering with the operation of such systems. This result may be accomplished by using tape, as shown in FIG. 5, but with one or both adhesive layers made of a material having a predetermined "yield point" below the temperature at which the thermostats are designed to operate the sprinkler system. A number of suitable formulations for such adhesive are well known, and can be used to drop the panels at the chosen temperature, thus exposing the sprinkler system to the fire.

It is to be understood that the form of the invention, herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of the parts may be resorted to without departing from the scope of the claim.

What I claim as my invention is:

A building panel structure comprising a rigid supporting core structure sheathed on at least one side by a plurality of flexible, thin, panel elements placed in edge-to-edge relationship and secured to the core structure, each panel element being rectangular in shape and provided with a peripheral flange lying in a plane and constituting a mounting surface, the area of the panel element within the peripheral flange being provided with longitudinal and transverse intersecting strips lying in the same plane as the peripheral flange and dividing the area of the panel element into a number of similarly shaped sections, each of these sections being displaced in the same sense of a direction normal to the plane of the peripheral flange to produce a series of raised, tile-like areas, the supporting core comprising a series of vertical spars having mounting surfaces lying in a common plane, the spars being spaced so that the distance between the centers of their mounting surfaces is equal to one dimension of the panel elements, and a series of parallel horizontal spars having mounting surfaces lying in the same plane as the mounting surfaces of the vertical spars and spaced so that the distance between the centers of two adjacent mounting surfaces is equal to the other dimension of the panel elements and double faced adhesive tape between the mounting surfaces of the vertical and horizontal spars and the mounting surfaces of the panel elements to hold the panel elements to the core structure producing a light, rigid sheathed building panel unit.

References Cited in the file of this patent

UNITED STATES PATENTS

1,192,890	Gulick	Aug. 1, 1916
1,624,741	Leppke et al.	Apr. 12, 1927
1,858,957	Humphner	May 17, 1932
1,875,766	Schubert	Sept. 6, 1932
2,326,581	Cleef	Aug. 10, 1943
2,412,693	Pierson	Dec. 17, 1946
2,650,185	Larson et al.	Aug. 25, 1953
2,659,169	Brennan	Nov. 17, 1953