

[54] **MODULAR INSULATED PANEL SYSTEM**
[75] Inventor: **Gino L. Baruzzini, O'Fallon, Mo.**
[73] Assignee: **Pet Incorporated, St. Louis, Mo.**
[22] Filed: **Sept. 14, 1970**
[21] Appl. No.: **71,735**

2,966,967	1/1961	Levy et al.	52/36
3,397,428	8/1968	Donald	264/171
3,448,183	6/1969	Chisholm	264/171
3,490,800	1/1970	Wissler	52/586
3,512,819	5/1970	Morgan et al.	52/309
3,564,801	2/1971	Huerta	52/309
3,626,652	12/1971	Hanley	52/586

FOREIGN PATENTS OR APPLICATIONS

[52] U.S. Cl. 52/264, 52/481, 52/586, 52/403
[51] Int. Cl. E04b 1/343, E04b 1/38
[58] Field of Search.....52/264, 272-275, 52/396, 401, 578, 582, 584, 479-481, 417, 461, 465, 463, 586, 620, 627, 36, 307, 613; 248/243; 264/171

46,857	8/1936	France	52/495
761,444	1/1934	France	52/481
769,067	6/1934	France	52/481
775,877	10/1934	France	52/479
1,336,243	7/1963	France	52/403
1,452,891	8/1966	France	52/393
1,354,946	2/1964	France	52/613

Primary Examiner—Frank L. Abbott
Assistant Examiner—James L. Ridgill, Jr.
Attorney—Richard G. Heywood

[56] **References Cited**

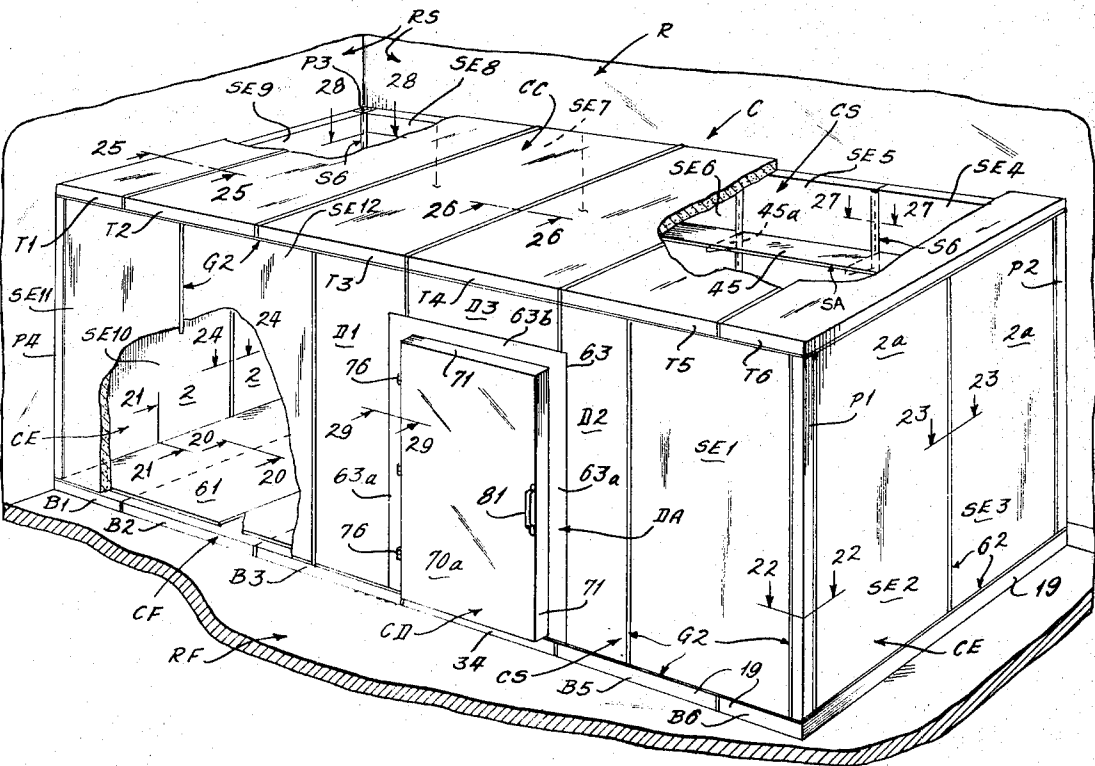
UNITED STATES PATENTS

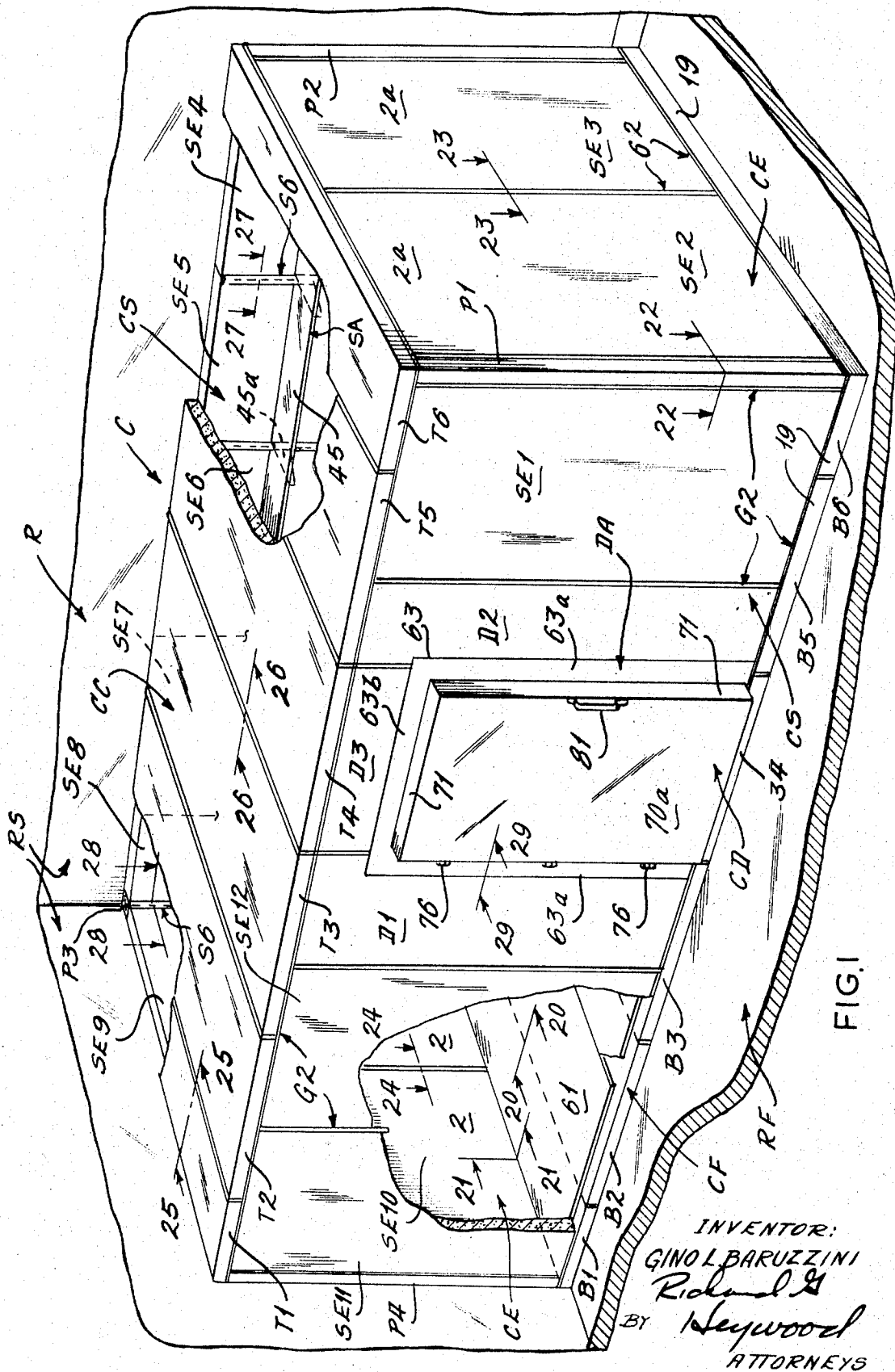
1,021,867	4/1912	Goss	52/711
2,137,767	11/1938	Betcone	52/274
2,143,288	1/1939	Stolz	287/189.36 D
2,223,016	11/1940	Parkhurst	52/584
2,988,855	6/1961	Asfour et al.	52/711
3,392,497	7/1968	Cushman	52/584
3,508,369	4/1970	Tennison	52/43
3,570,205	3/1971	Payne	52/403

[57] **ABSTRACT**

A modular insulated panel system in which a series of panels are assembled together with panel locking and sealing members to form an enclosed insulated space adapted for different environmental conditioning than the contiguous area.

13 Claims, 39 Drawing Figures





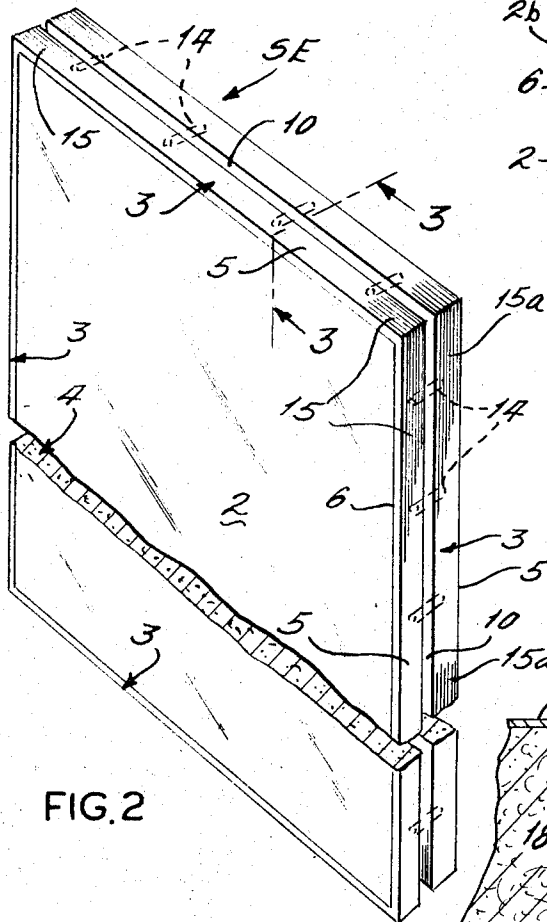


FIG. 2

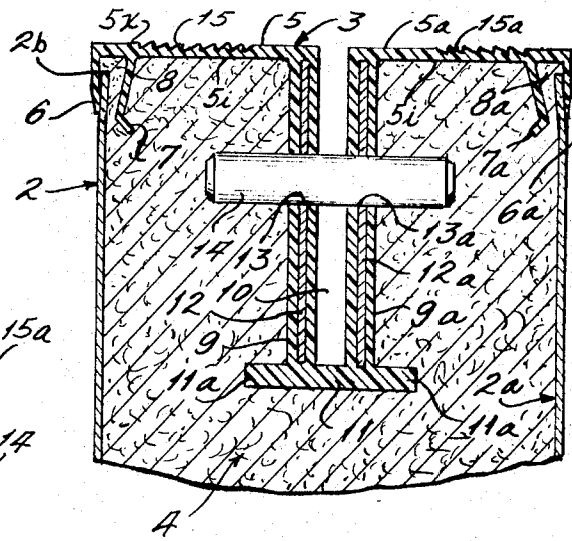


FIG. 3

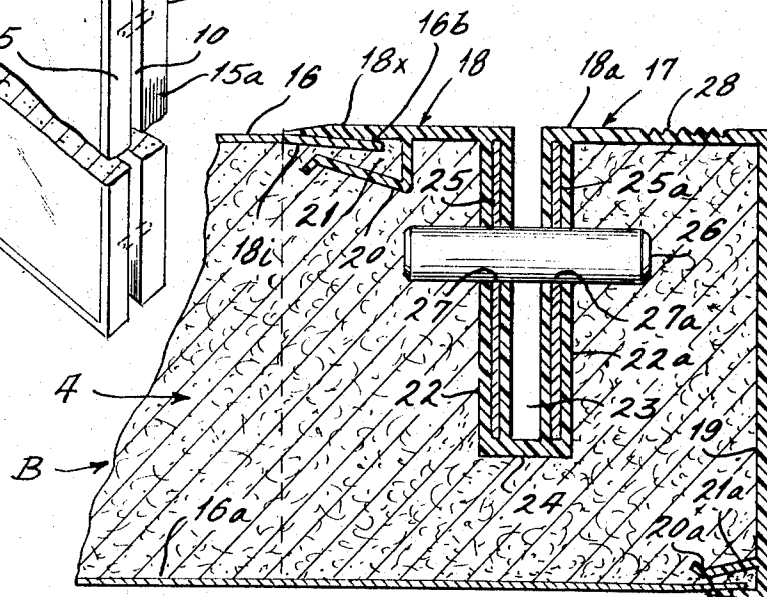


FIG. 5 19a' 163

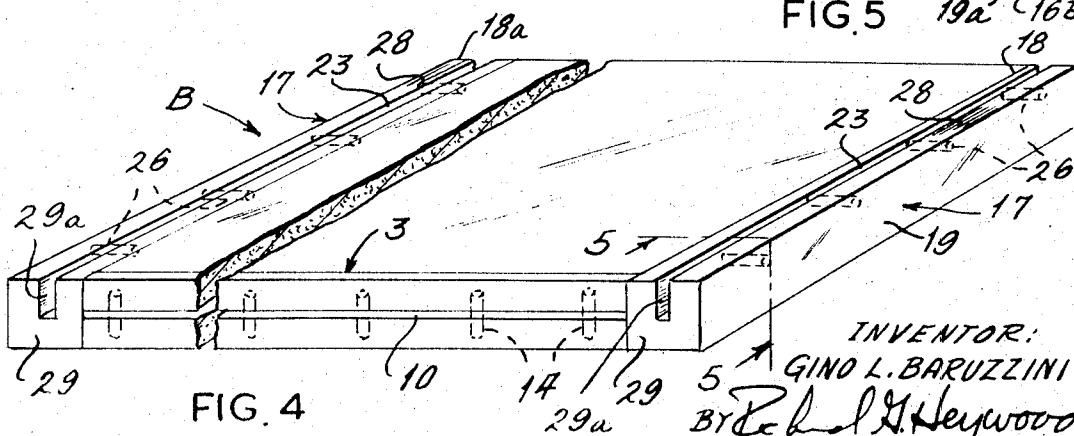


FIG. 4

INVENTOR:
GINO L. BARUZZINI
By W. H. Heywood
ATTORNEY

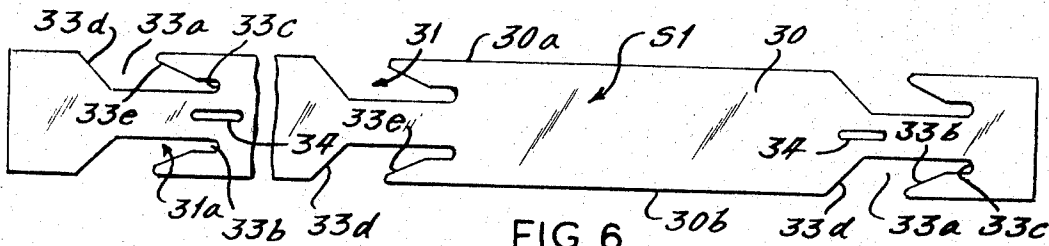


FIG. 6

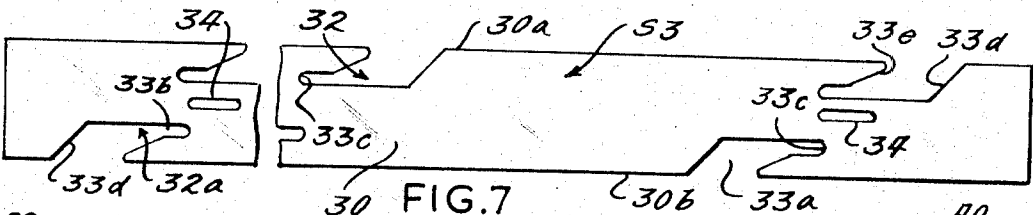


FIG. 7

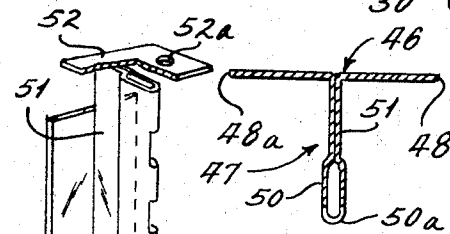


FIG. 9

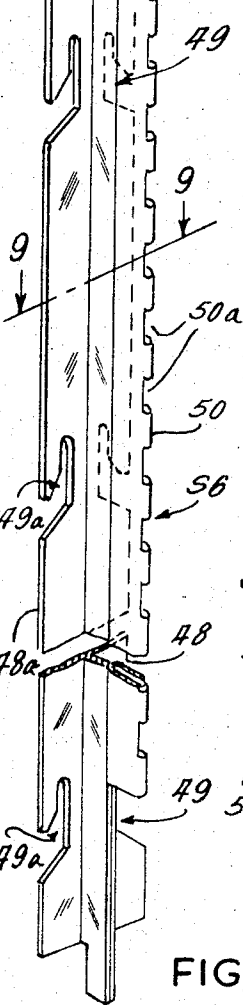


FIG. 8

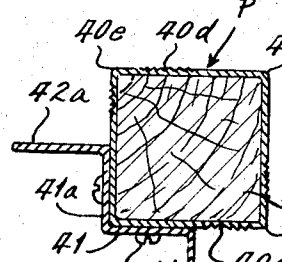


FIG. 11

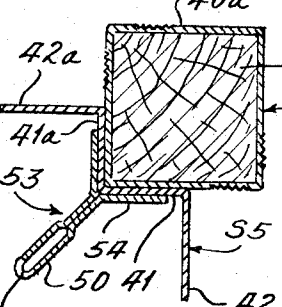


FIG. 13

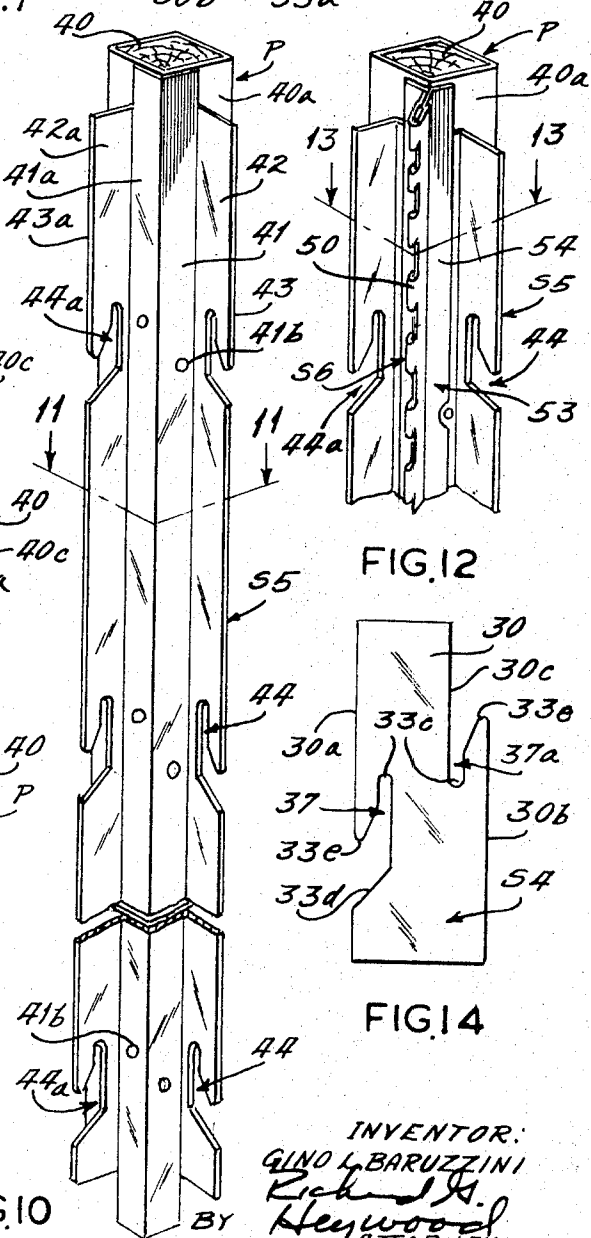


FIG. 10

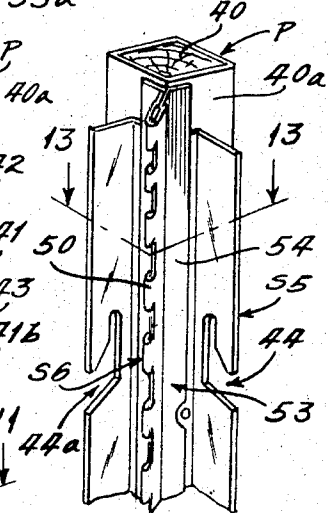


FIG. 12

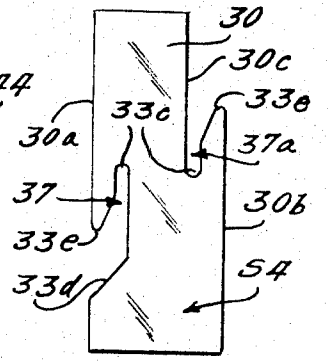


FIG. 14

INVENTOR:
GINO L. BARUZZINI
BY *Richard A. Heywood*
ATTORNEY

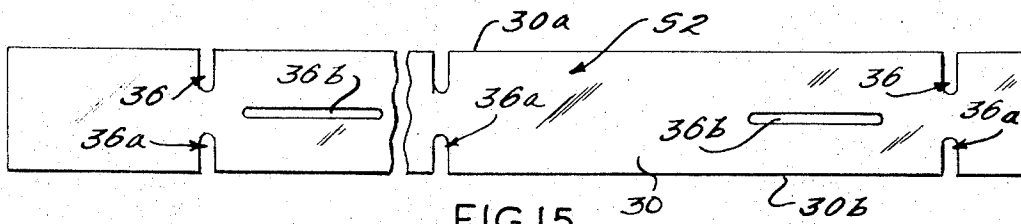


FIG. 15

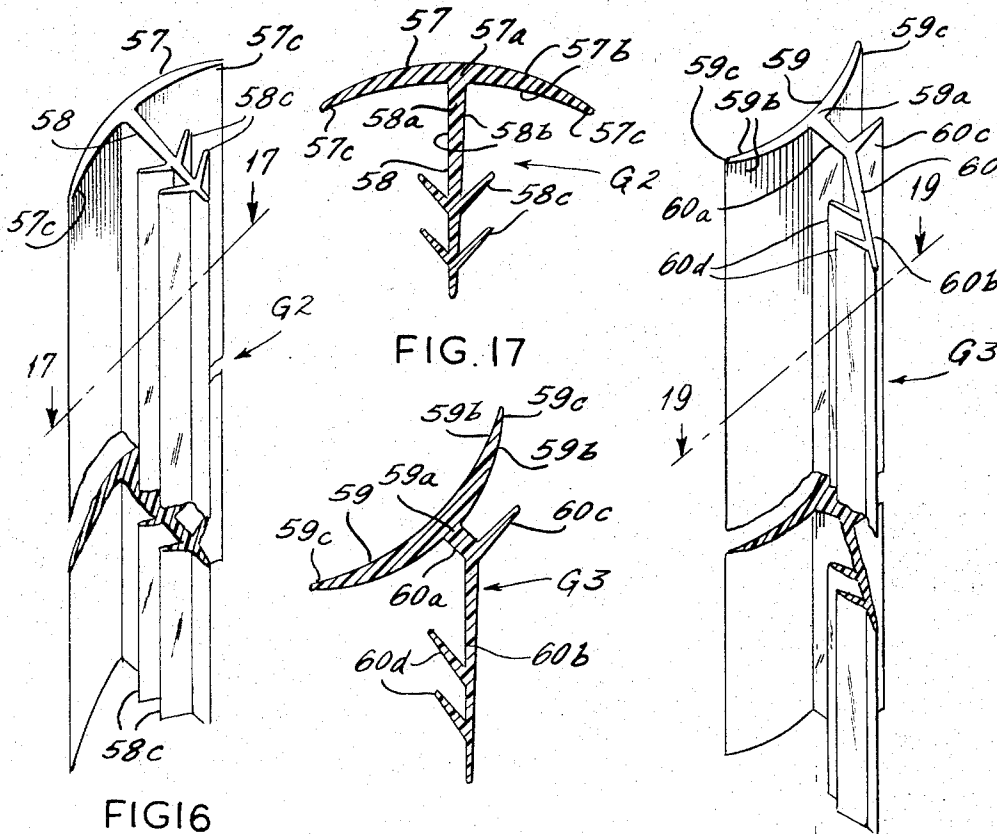


FIG. 16

FIG. 17

FIG. 19

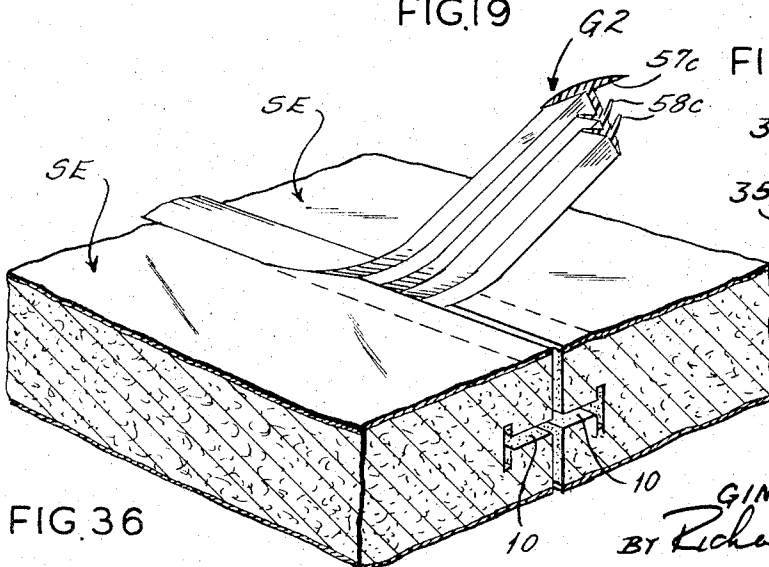


FIG. 36

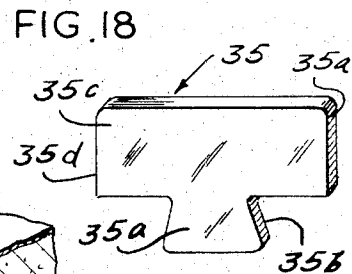
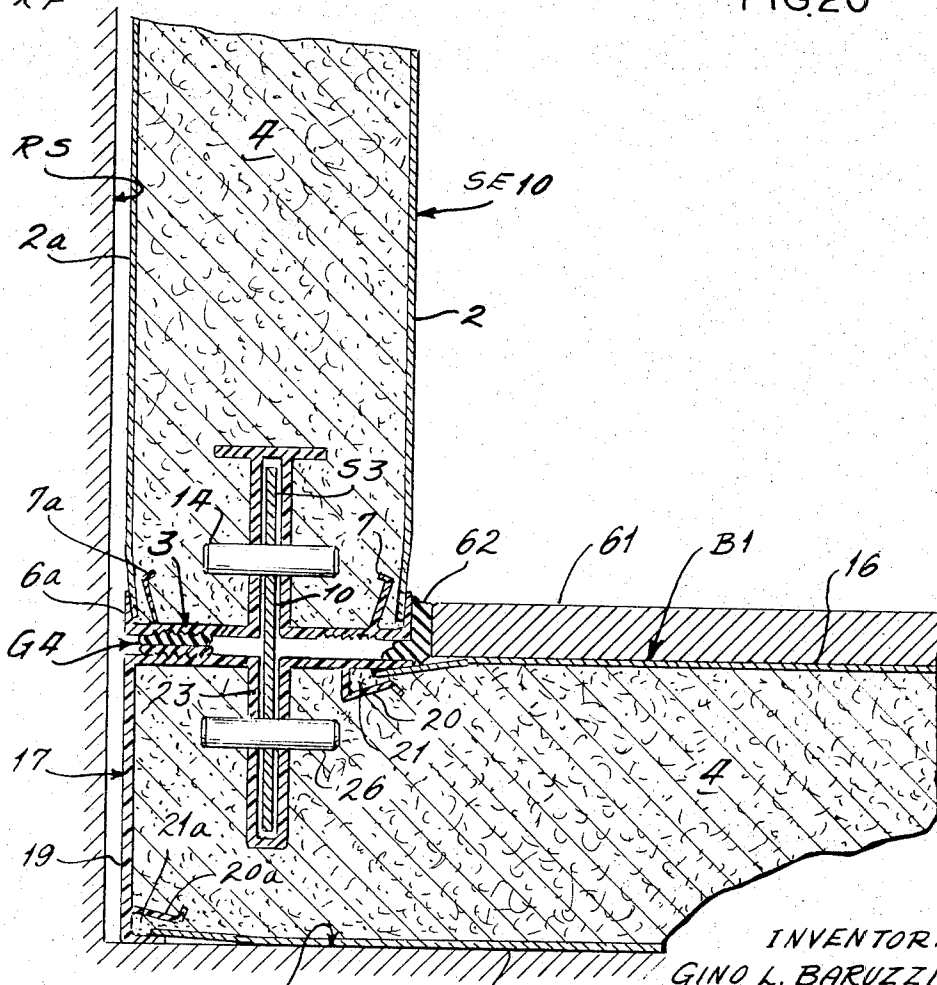
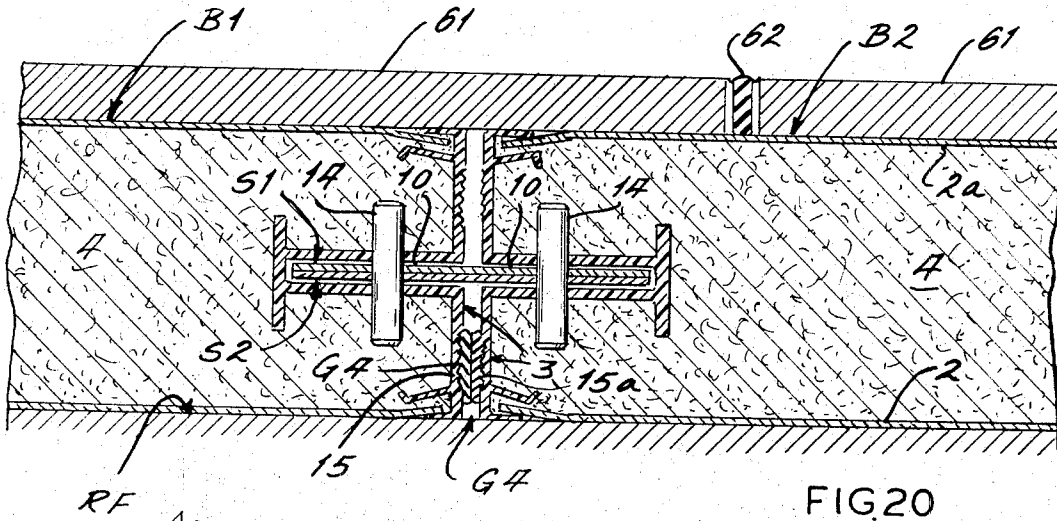


FIG. 37

INVENTOR:
GINO L. BARUZZINI
BY *Richard D. Heywood*
ATTORNEY.



INVENTOR:
GINO L. BARUZZINI
By Richard H. Heywood
ATTORNEY,

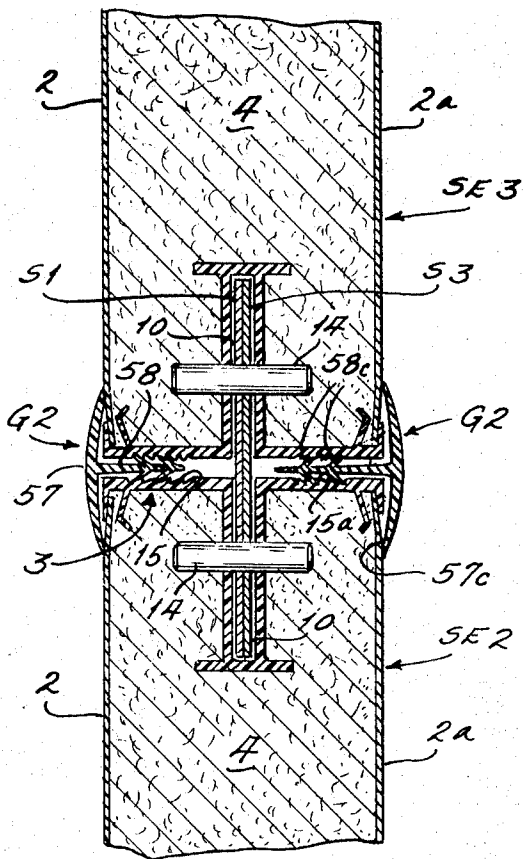


FIG. 23

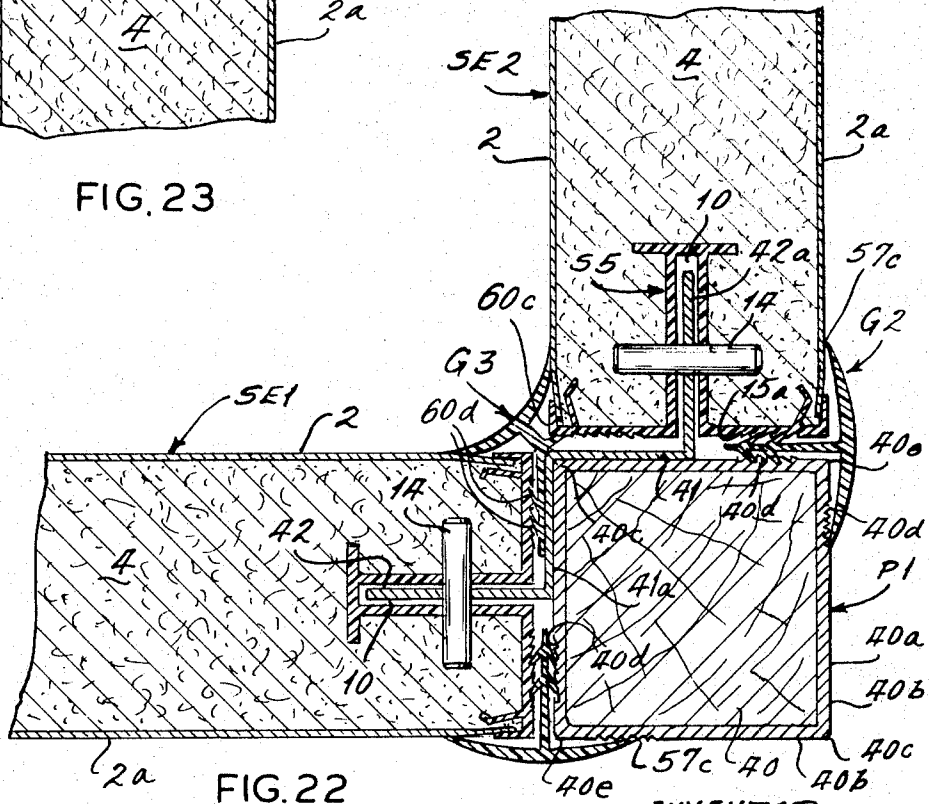


FIG. 22

INVENTOR:
GINO L. BARUZZINI
BY *Richard H. Heywood*
ATTORNEY

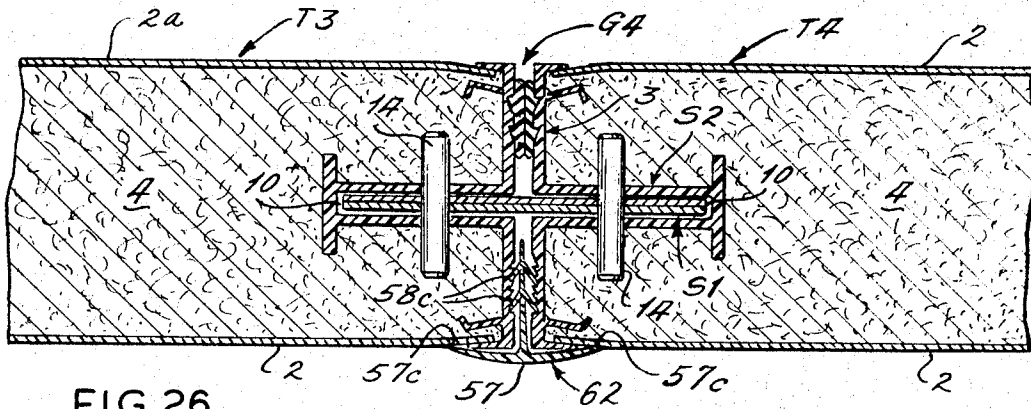


FIG. 26

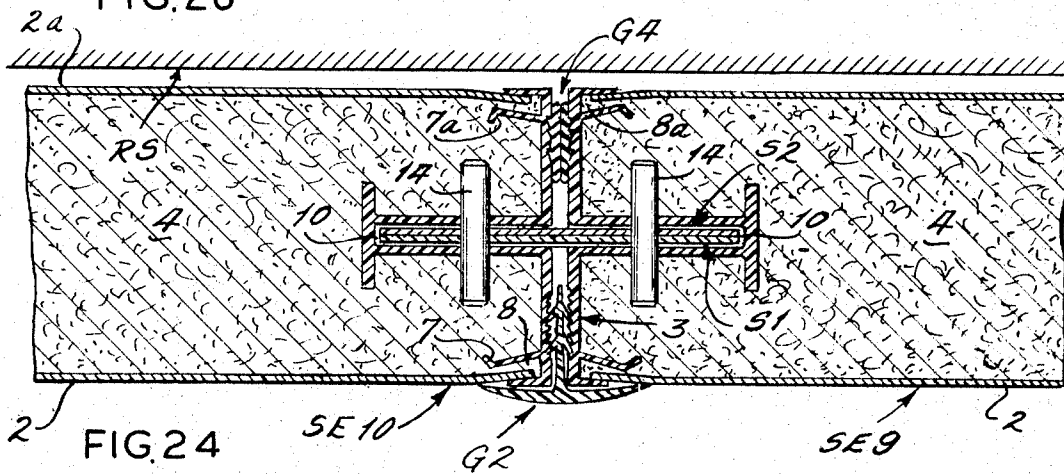


FIG. 24

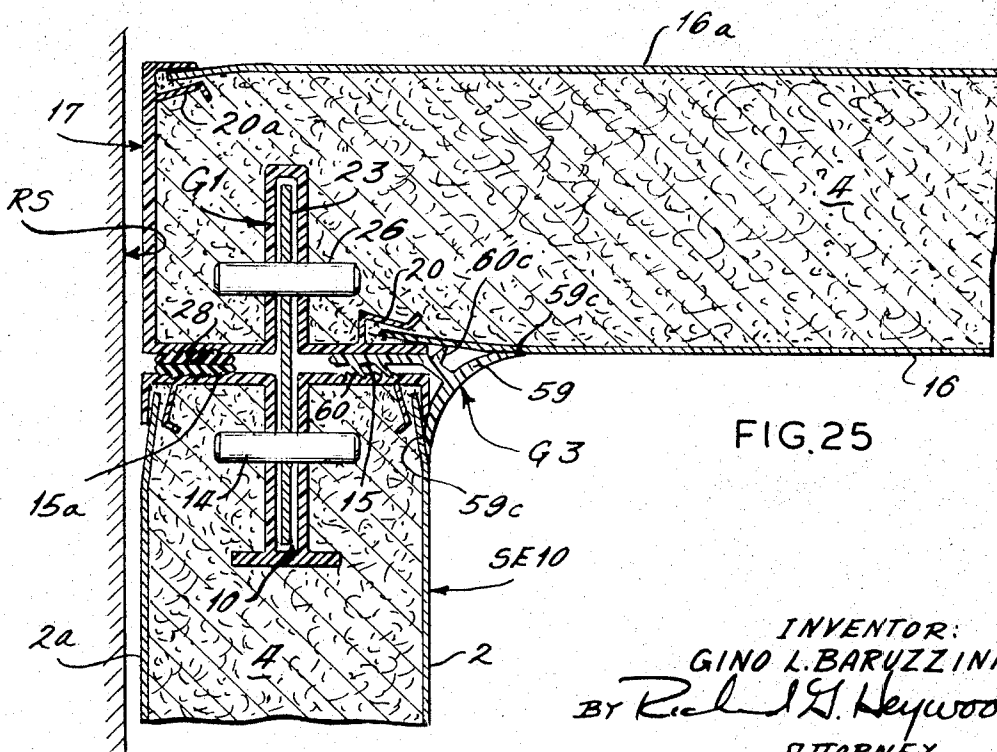


FIG. 25

INVENTOR:
GINO L. BARUZZINI
BY *Richard G. Heywood*
ATTORNEY.

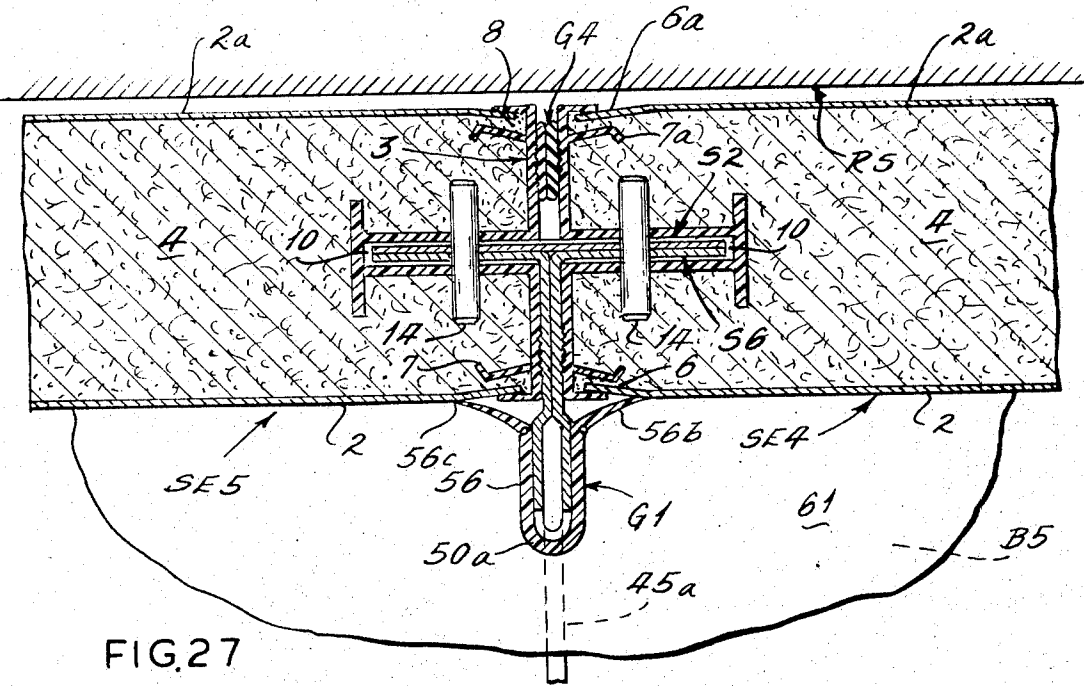


FIG. 27

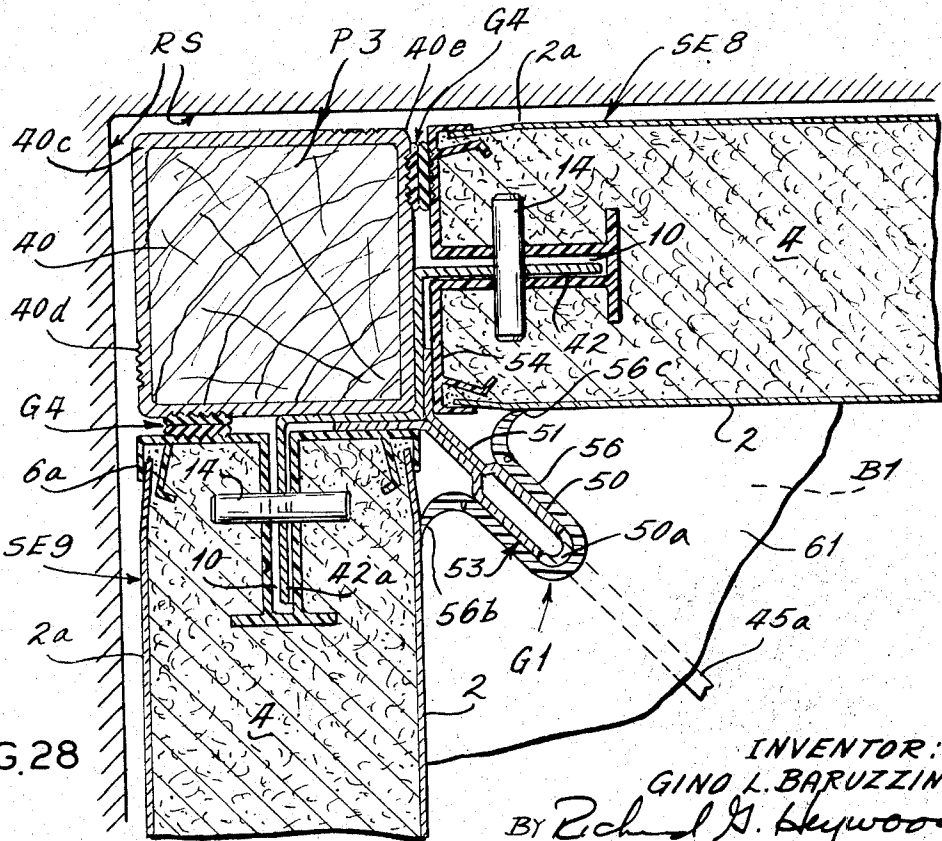
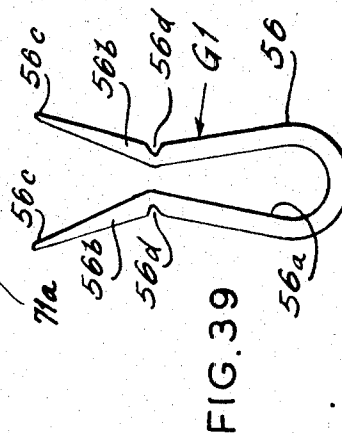
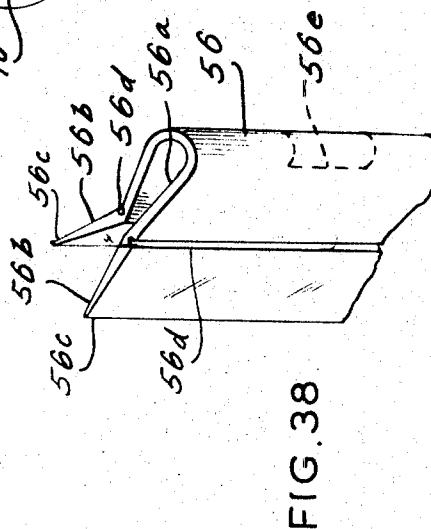
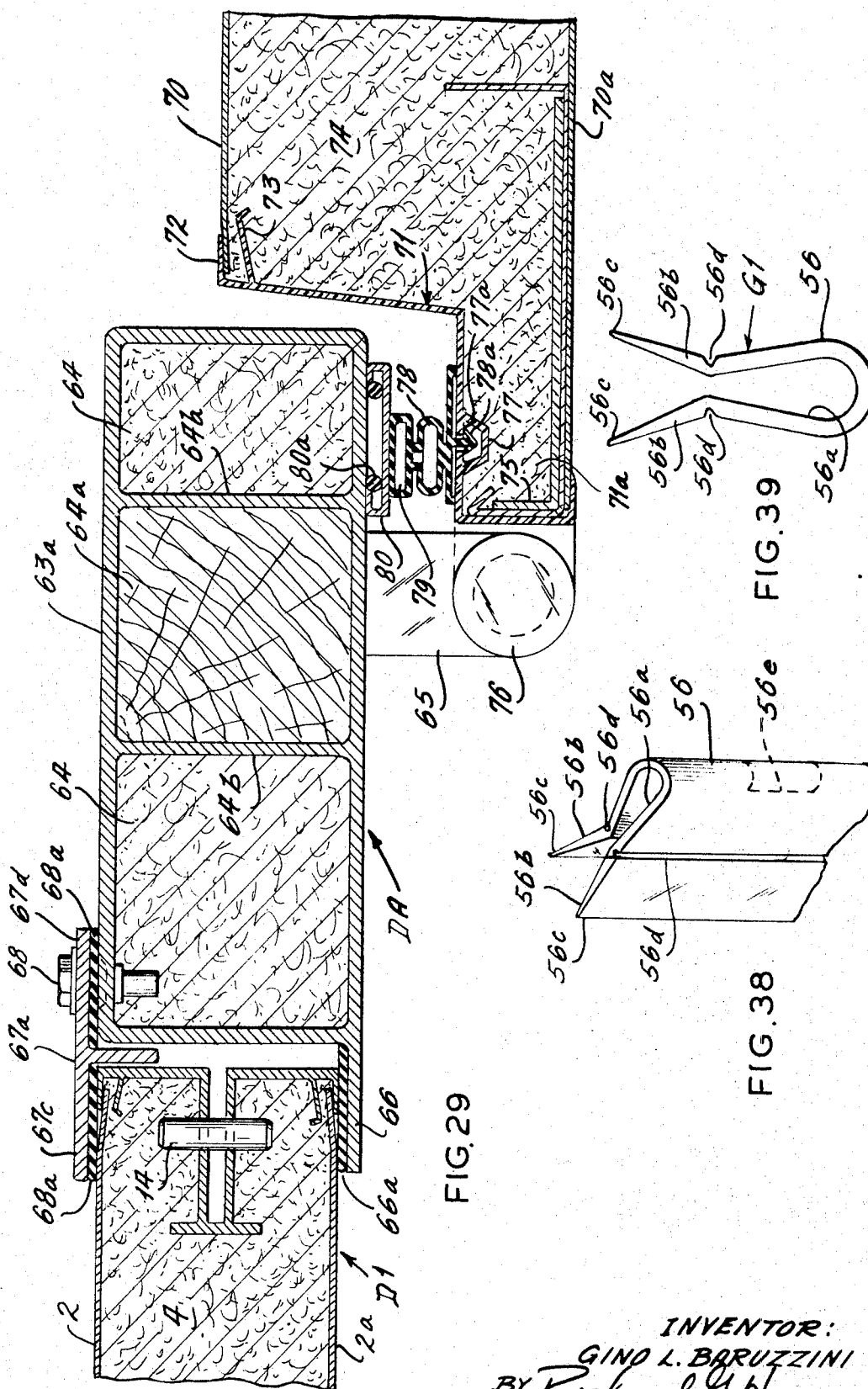


FIG. 28

INVENTOR:
GINO L. BARUZZINI
BY Richard G. Heywood
ATTORNEY



INVENTOR:
GINO L. BARUZZINI
BY Richard S. Heywood
ATTORNEY,

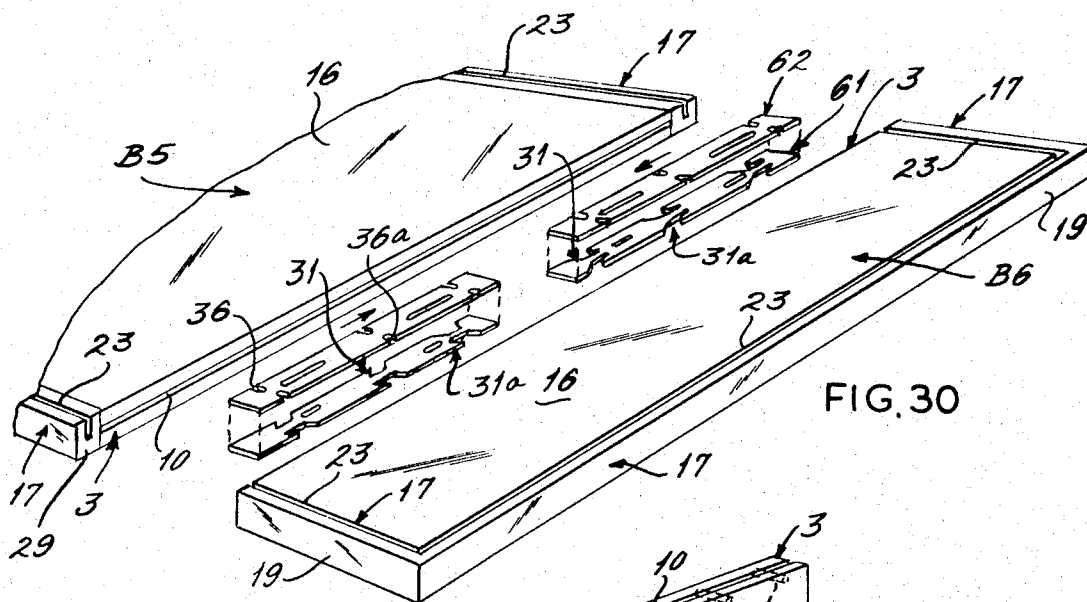


FIG. 30

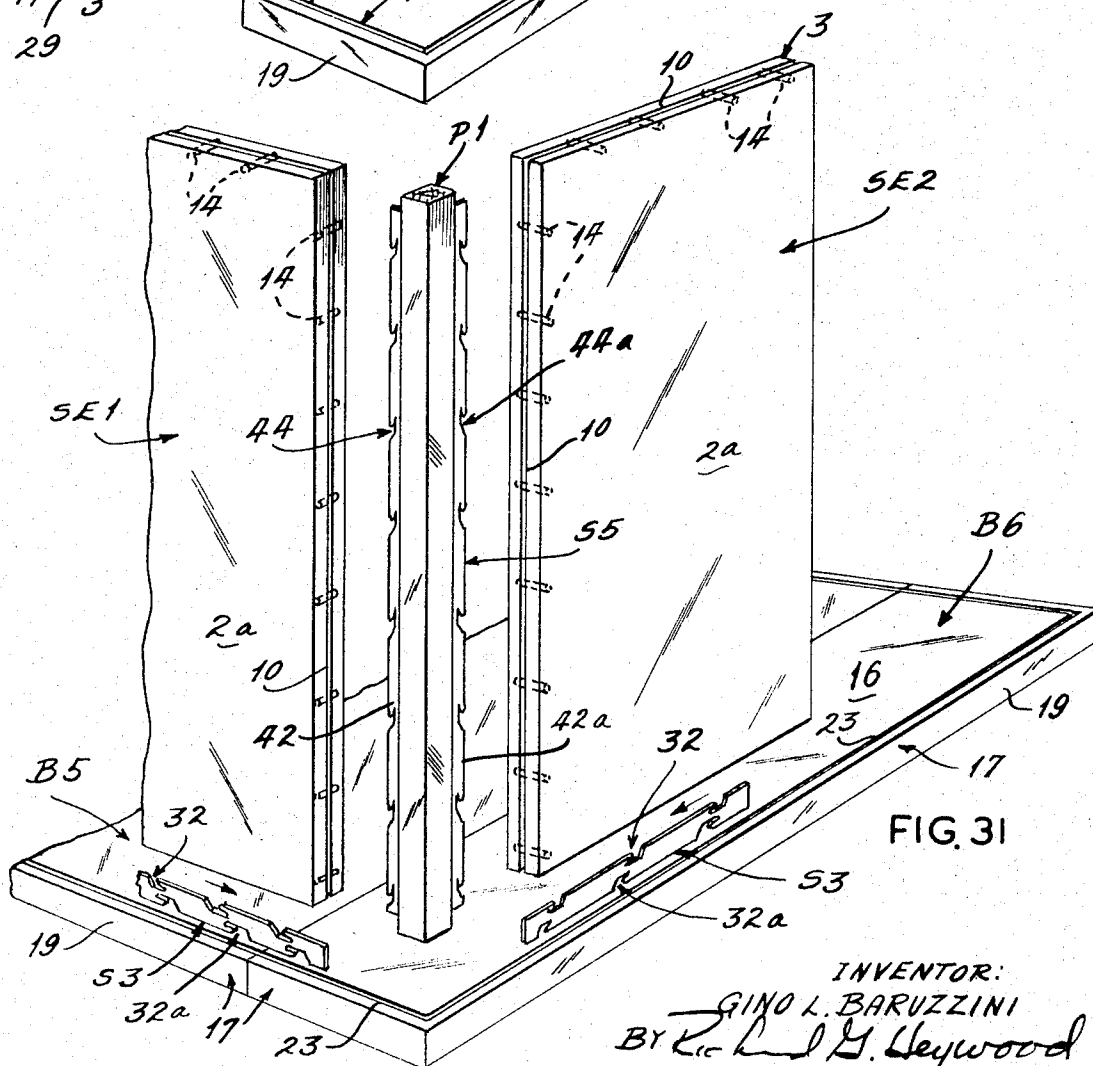


FIG. 31

INVENTOR:
GINO L. BARUZZINI
BY *R. L. Heywood*
ATTORNEY.

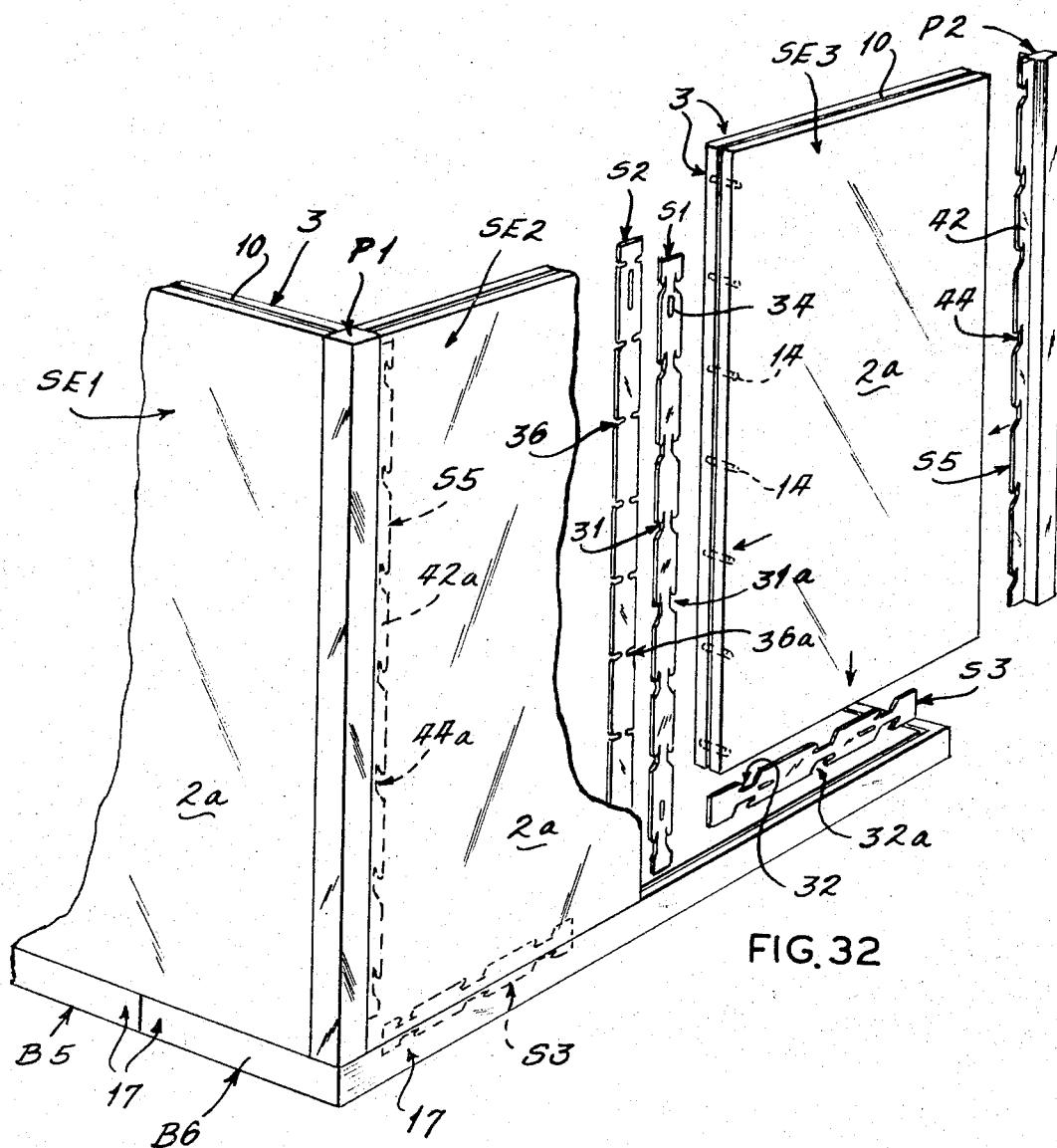
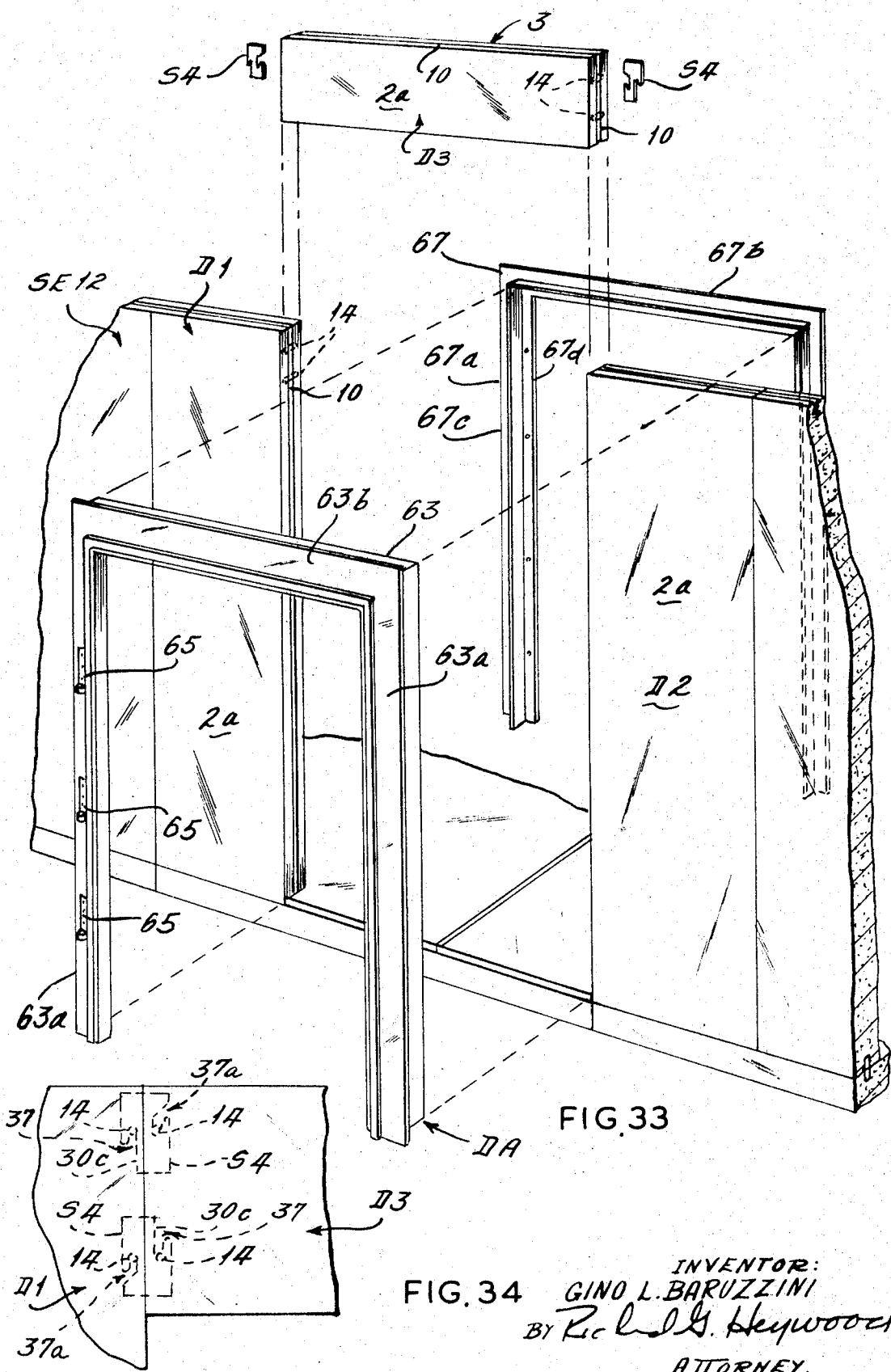
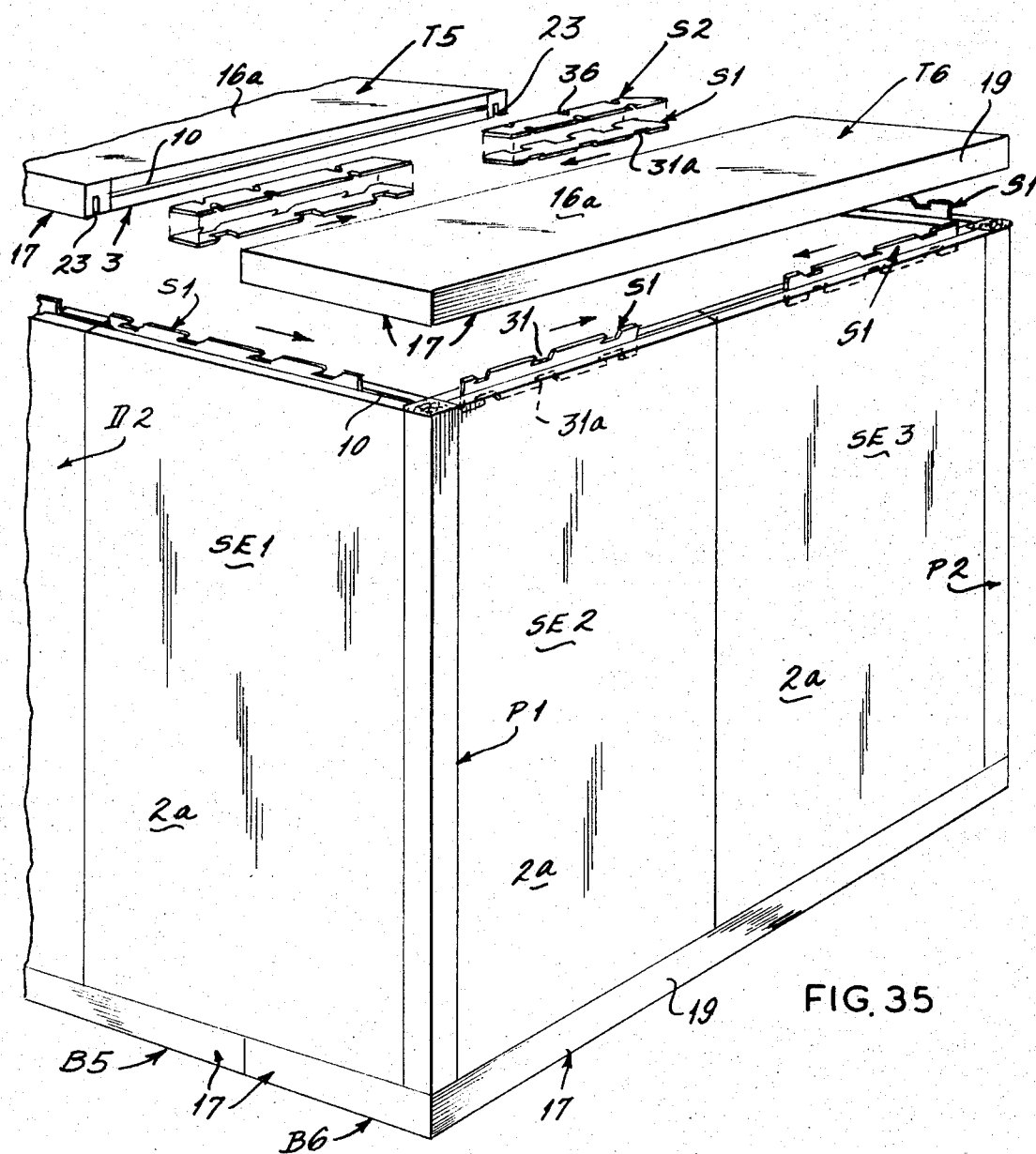


FIG. 32

INVENTOR:
GINO L. BARUZZINI
BY *Richard G. Heywood*
ATTORNEY,



INVENTOR:
GINO L. BARUZZINI
BY *Richard G. Heywood*
ATTORNEY,



INVENTOR:
GINO L. BARUZZINI
BY *Richard H. Heywood*
ATTORNEY

MODULAR INSULATED PANEL SYSTEM

BACKGROUND OF THE INVENTION

The invention relates generally to panel systems forming partition walls or complete enclosures, and more particularly to insulated or isolated spaces having a controlled environment.

Many panel systems have been developed for installation in different types of facilities and for use by a wide variety of businesses or industries in which prefabricated partition walls or complete enclosures are required to form separate adjoining areas such as office cubicles, laboratory and research facilities, warehousing or storage facilities, production facilities, treatment rooms and the like. In many cases, it is essential or highly desirable to sound-proof certain areas or to maintain different environmental conditions such as temperature, humidity, atmosphere and the like. It is manifest that the conditions of use will usually dictate the minimum requirements and specifications of any panel system and factors of strength, rigidity, durability, appearance, etc. will thus be determined. In panel systems forming enclosed spaces in which environmental control is to be effected, the integrity of the sealing arrangement is a major factor to maintain a uniform temperature gradient or minimize moisture migration or other interchange of atmosphere except as may occur naturally as a result of ingress or egress.

Without limitation upon the scope of the panel system invention to other applications in different industries, a typical and preferred embodiment of the present modular insulated panel system invention hereinafter selected for purposes of illustration and disclosure comprises a refrigerated enclosure of the type known in the refrigeration industry as a walk-in cooler. Such coolers may be installed in supermarkets or numerous other types of businesses for the storage of merchandise under refrigeration or other environmental conditioning than the adjoining area in which the cooler is installed. In the past such walk-in coolers have been fabricated with wall panels having a wooden frame within which an insulating material has been packed and covered by outer porcelainized metallic casing or liner sheets secured by an adhesive bonding material. These panels were secured together by spaced cam locking devices recessed into the wooden frame and accessible through exterior ports, with sealing gaskets being provided on adjacent abutting surfaces. Conventional wood or metal flooring has been utilized and ceiling or top panel structures were similar. Such panel systems, as others used in industry, have been expensive to build with problems of maintaining manufacturing tolerances and quality control, have been expensive to ship and handle due to the weight and bulk thereof, and have been expensive to install for like reasons.

SUMMARY OF THE INVENTION

Briefly, the invention comprises a novel modular panel system adapted to form insulated or sound-proof partition walls or an entire enclosure, such as a self-supporting insulated cooler for the storage of refrigerated products. The panel system comprises modular panel members provided with channel means in or adjacent to the edge margins and being fabricated with "foam" insulation in a novel manner to unify the

component parts, novel panel locking members insertable into opposed channel means of adjacent panel members in interlocking relationship, and novel sealing members applied between adjacent panel members.

The principal object of the present invention is to provide a novel panel system permitting the orientation and assembly of panel members into various arrangements of partition walls and complete enclosures having sound-proof or insulation characteristics adapting the delimited area for environmental control.

Another object of the invention is to provide a panel system utilizing panels fabricated in a novel manner and having optimum strength, rigidity, and insulation characteristics, and which are light weight and economically manufactured, stored, shipped and handled. It is also an object to provide a panel system forming a complete insulated enclosure that may quickly and easily be assembled with minimum manpower, time and tools.

Another object is to provide a novel panel interlocking arrangement for positive engagement between adjacent panels and structural strengthening thereof.

Another object is to provide novel sealing means for a panel system that is quickly applied and provides positive sealing engagement between adjacent insulated members to assure the integrity of the system for environmental conditioning.

A more specific object of the invention is to provide a panel system forming a refrigerated enclosure or walk-in cooler for the refrigerated storage of food products or the like in supermarkets and other stores.

These and still other objects and advantages will become more apparent hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

For purposes of illustration and disclosure, the invention is embodied in the parts and in the arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawings which form part of the specification and wherein like numerals refer to like parts wherever they occur:

FIG. 1 is a perspective view, partly broken away, of an insulated cooler cabinet embodying the modular insulated panel system of the present invention,

FIG. 2 is a fragmentary perspective view of a typical side or end panel module,

FIG. 3 is a greatly enlarged cross-sectional view taken along line 3—3 of FIG. 2,

FIG. 4 is a fragmentary perspective view of a typical bottom or top panel module,

FIG. 5 is a greatly enlarged cross-sectional view taken along line 5—5 of FIG. 4,

FIG. 6 is a fragmentary plan view of one form of panel locking spline embodied in the invention,

FIG. 7 is a fragmentary plan view of another form of panel locking spline embodied in the invention,

FIG. 8 is a fragmentary perspective view of another form of panel locking spline embodied in the invention,

FIG. 9 is an enlarged cross-sectional view taken along line 9—9 of FIG. 8,

FIG. 10 is a fragmentary perspective view of a corner post and a corner locking spline embodied in the invention,

FIG. 11 is an enlarged cross-sectional view taken along line 11—11 of FIG. 10,

FIG. 12 is a fragmentary perspective view of a corner post and another corner locking spline arrangement embodied in the invention,

FIG. 13 is an enlarged cross-sectional view taken along line 13—13 of FIG. 12,

FIG. 14 is a plan view of another panel locking form of spline embodied in the invention,

FIG. 15 is a plan view of still another form of panel locking spline embodied in the invention,

FIG. 16 is a fragmentary perspective view of one form of sealing gasket embodied in the invention,

FIG. 17 is an enlarged cross-sectional view taken along line 17—17 of FIG. 16,

FIG. 18 is a fragmentary perspective view of another form of sealing gasket embodied in the invention,

FIG. 19 is an enlarged cross-sectional view taken along line 19—19 of FIG. 18,

FIG. 20 is an enlarged cross-sectional view taken along line 20—20 of FIG. 1,

FIG. 21 is an enlarged cross-sectional view taken along line 21—21 of FIG. 1,

FIG. 22 is an enlarged cross-sectional view taken along line 22—22 of FIG. 1,

FIG. 23 is an enlarged cross-sectional view taken along line 23—23 of FIG. 1,

FIG. 24 is an enlarged cross-sectional view taken along line 24—24 of FIG. 1,

FIG. 25 is an enlarged cross-sectional view taken along line 25—25 of FIG. 1,

FIG. 26 is an enlarged cross-sectional view taken along line 26—26 of FIG. 1,

FIG. 27 is an enlarged cross-sectional view taken along line 27—27 of FIG. 1,

FIG. 28 is an enlarged cross-sectional view taken along line 28—28 of FIG. 1,

FIG. 29 is an enlarged cross-sectional view taken along line 29—29 of FIG. 1,

FIG. 30 is an exploded perspective view illustrating the assembly procedure of the bottom panels,

FIG. 31 is an exploded perspective view showing the initial assembly procedure of the side and end panels with the bottom and corner post,

FIG. 32 is an exploded perspective view showing further assembly procedure of the side or end panels with the bottom,

FIG. 33 is an exploded perspective view of the side panel and door frame assembly procedure,

FIG. 34 is a greatly enlarged fragmentary elevational detail of the door frame side and header panel assembly,

FIG. 35 is an exploded perspective view of the assembly procedure of the top panels,

FIG. 36 is an enlarged fragmentary perspective view illustrating application of a typical sealing gasket,

FIG. 37 is a perspective view of a special tool used in assembling the modular insulated panel system embodying the present invention,

FIG. 38 is a fragmentary perspective view of still another form of sealing gasket embodied in the invention, and

FIG. 39 is an enlarged cross-sectional view taken along line 39—39 of FIG. 38.

DESCRIPTION OF THE PREFERRED EMBODIMENT

As previously indicated, a preferred embodiment of the modular insulated panel system invention herein selected for disclosure purposes comprises a complete refrigerated enclosure of the type known in the refrigeration trade as a walk-in cooler, generally designated by reference numeral C in FIG. 1. The cooler C may be installed in a Room R or suitable space such as the backroom or processing area of a supermarket having a floor RF and side walls RS as shown in FIG. 1. The cooler C includes a bottom section or floor CF, a top section or ceiling CC and opposed side and end sections or walls CS and CE, respectively, defining the enclosure and forming an internal storage space or area CA accessible through the cooler door CD. Although not shown in the drawings, it will be readily apparent that the area CA is provided with a suitable source of refrigeration which may be a conventional evaporator unit usually suspended from the ceiling CC and operated from a remote condensing unit or refrigerated air may be ducted into the cooler area CA from a remote evaporator unit.

Still referring to FIG. 1, the walk-in cooler C is provided with a plurality of groups or series of insulated modules, partitions or panel members of novel and like construction. The bottom section CF comprises a first series of sequential panel module or members B1 through B6 and the top section CC comprises a series of similar sequentially arranged panel module or members T1 through T6, although the top panel members are oriented in an inverted position relative to the bottom panels as will be described more fully. While each of the side and end wall sections CS and CE comprises a second series of vertical panel module or members (and in other installations, such as partition walls, such a straight line series may comprise the entire panel system), the panel members of the side and end walls are sequentially designated as SE1 through SE12 in a counterclockwise order to correlate with a typical assembly procedure hereinafter described. In addition, one side or end wall section includes closure panels D1, D2 and D3 defining an opening in which door assembly DA for the cooler door CD is mounted. The side and end panels SE1—SE12 are sequentially assembled with corner posts P1 through P4 to form the rectangular vertical walls of the cooler cabinet. The cooler C may also be provided with a shelf assembly SA, which will be described more fully hereinafter as will the novel locking members for interlocking the panel system in assembled relation and the sealing members for sealing between adjacent panel members.

Referring now to FIGS. 2 and 3 wherein a typical side or end panel module or member SE (1—12) is illustrated, each of these panels SE is of predetermined dimension to accommodate the modular aspect of the panel system. For instance, a standard side or end panel may have an 8-foot vertical dimension and a width of 4 feet, except that the panels SE abutting the corner posts P1—P4 will be narrower by the lateral dimension of the corner post, i.e., a 2-inch post will require adjacent panels of 46 inches.

Each panel member SE (1—12) comprises inner and outer surface casings or liners 2,2a of rectangular configuration and having peripheral edges or margins 2b,

the liners 2,2a being spaced apart by peripherally aligned end caps or edge channel members 3 of generally T-shaped configuration to define a central cavity filled with and providing a foam insulation body 4 of polyurethane or the like. The liners 2,2a are preferably formed of cold rolled commercial quality sheet steel or the like, and the edge or channel members 3 are preferably formed of extruded plastic, such as Acrylonitrile Butadiene Styrene (ABS).

As shown best in FIG. 3, the edge or channel members 3 extend longitudinally along each peripheral margin of the panel member SE or, in other words, the panel member is enclosed by opposed pairs of lengthwise and laterally extending members 3 of identical configuration arranged in overlapping and contiguous relationship with the juxtaposed marginal edges 2b of the liners 2,2a. The edge or channel members 3 are provided with spaced apart base portions 5,5a having exterior and interior sides or surfaces 5x,5i and first or liner abutment flanges 6,6a are integrally formed on the base portions 5,5a to define the lengthwise side edges thereof and extend normal to the base portions substantially parallel with the liners 2,2a. Closely adjacent to and extending in a parallel direction with the outer liner abutment flanges 6,6a are another set of locking flanges 7,7a, these second flanges 7,7a being integrally formed with the base interior surface 5i at a slight outward angle therewith to define with the adjacent side flange 6,6a wedge or key-stone shaped channels 8,8a therebetween extending lengthwise of the edge members 3. A pair of opposed, spaced channel walls 9,9a are also integrally formed with base portions 5,5a adjacent to the mid-portion thereof to form the T-shaped configuration and define an elongated spline receiving groove, slot or channel 10 lengthwise of the base extending peripherally around the entire side or end wall panel SE. A base or cross wall 11 is integrally formed across the walls 9,9a to close the groove 10 and includes integrally formed extensions 11a for displacement preventing bonding engagement with the insulation body 4. If desired, strengthening or reinforcing members 12,12a, such as rigid nylon or metallic strips, may be extruded into the channel walls 9,9a or may be bonded to either surface of the channel walls 9,9a. A plurality of opposed aligned pin receiving bores or apertures 13,13a are provided through the groove walls 9,9a and reinforcing members 12,12a in predetermined spaced relation lengthwise of the edge members SE, and a plurality of spline locking lugs or pins 14 are pressed into and fixedly received in said opposed apertures 13,13a extending across the groove 10. It should be noted that the location and spacing of pins 14 in the respective panel members SE, B and T are specific in order to assure closely adjacent or abutting interlocking engagement therebetween by the locking members to be described. As shown in FIG. 2, the lateral or shorter ends of a typical standard panel SE are provided with four pins, and the longitudinal or vertical sides are provided with seven pins 14, although other pin locking arrangements may be provided. In addition, longitudinally extending serrations or grooves 15,15a are provided lengthwise of the base portions 5,5a in the exterior surface 5x thereof intermediate to the flanges 6,6a and central channel 10 for sealing purposes, as described hereinafter.

Still referring to FIGS. 2 and 3, in the assembled relationship of the components of the side and end panels SE, the extruded channel or first members 3 are provided with the reinforcing strip elements 12,12a and the pins 14 are pressed into the opposed openings 13,13a in channel walls 9,9a. The channel members 3 are cut to end and side length with mitered ends and the liner or second members 2,2a are positioned with the margins 2b in the wedge-shaped channels 8,8a in abutment with the outer flanges 6,6a. A specific or predetermined amount of polyurethane or like plastic is provided for each panel module SE and, in applying the froth foaming process, the plastic expands to completely fill the interior panel space to surround the pins 14 and channel walls 9,9a, 11,11a and extend into the wedge-shaped channels 8,8a to firmly hold the liner margins 2b against flanges 6,6a. It should be noted that no other fastening means or the like are utilized in forming the panel members SE.

Referring now to FIGS. 4 and 5 wherein a typical intermediate bottom panel module or member B (2-5) or top panel T (2-5) is illustrated, each of these panels is of similar construction to the side and end panels SE and of predetermined dimension to accommodate the modular aspect of the panel system. For instance, a standard intermediate panel may have an 8-foot length to correspond to the width of two end panels SE and two corner post P and the lateral or end dimension similarly will be 4 feet.

The end or closure bottom panel members B1 and B6 (or top panels T1 and T6) are also of similar construction, but are dimensioned with shorter lateral ends, such as 2 feet to provide an overlapping or offset relationship between the joints of the bottom and top walls CF and CC relative to the joints of the side and end walls SE.

Still referring to FIGS. 4 and 5, each of the intermediate panel members B (or top panels T) comprises inner and outer surface casings or liners 16,16a having peripheral edges or margins 16b, but the inner liner 16 is predeterminedly shorter than the outer liner 16a. The bottom panel member B (or top panel T) is provided with the T-shaped edge channel members 3 (identical to those described with reference to side panels SE in FIGS. 2 and 3) extending along its outer longitudinal sides to adjacent the ends. The lateral ends of the intermediate panels B are provided with L-shaped channel members 17 engaged in overlapping contiguous relationship with the juxtaposed marginal edges 16b of the liners 16,16a as described hereinafter, with insulation material 4 being formed into the interior chamber of the panel B in bonding relation with the liners 16,16a and edge members 3,17.

The L-shaped edge or channel members 17 are formed of extruded plastic, such as Acrylonitrile Butadiene Styrene (ABS), and comprise spaced apart channel forming walls or legs 18,18a including first or liner abutment flanges and an end wall or leg 19 formed at right angles thereto, the base walls 18,18a extending in the plane of the short liner 16 and the end walls 19 extending normal thereto and defining the lateral end margins of the panel B. The spaced base walls 18,18a have exterior and interior sides or surfaces 18x,18i and the inner surfaces 18i of base walls 18 adjacent the free margin thereof form abutment surfaces for the end

margins 16b of the shorter panel liner 16. Locking or second flanges 20 are angularly formed from these inner surfaces 18i to define wedge or keystone-shaped channels 21 with the base walls 18. Similarly, the end walls 19 of the channel members 17 are provided with right-angle edge flanges 19a extending in the plane of the other liner 16a and forming a surface abutment with the end margins 16b thereof, and locking flanges 20b are formed from the end walls 19 extending in a parallel direction with the edge flanges 19a and defining therebetween wedge or keystone-shaped channels 21a.

Each of the L-shaped channel members 17 is also provided with a pair of opposed spaced channel walls 22,22a integrally formed with the base wall portions 18,18a to form a T-shaped configuration similar to the channel members 3 and define an elongated spline receiving groove, slot or channel 23 lengthwise of the base walls 18,18a extending parallel with and adjacent to the end wall 19 at each lateral end of the panel member B. A cross wall 24 interconnects the inner ends of the channel walls 22,22a to close the channel 23, but does not extend laterally beyond into the body cavity in order to facilitate the flow of plastic into the end channel members 17 during fabrication. The channel walls 22,22a may also be provided with reinforcing strip members 25,25a extruded therein or bonded thereto, and spline locking lugs or pins 26 are pressed into opposed openings 27,27a in predetermined spaced relation along the channel 23 and project outwardly of the channel walls 22,22a into the body cavity. These pins 26 are also specifically located to assure positive interlocking relationship between panel members. A series of adjacent serrations or grooves 28 are formed in the exterior surface 18x of the base wall portion 18a adjacent to the outer end wall 19 for sealing purposes. In addition, the L-shaped channel members 17 are provided with end caps 29 of rectangular shape and bonded to the base walls 18,18a and end wall 19 to close the ends of the channel members when assembled with the liners 16,16a and side channel members 3, the end caps 29 having grooves 29a continuous with the channels 23. It will thus be apparent that the channel means 23,29a extend across the end portions of the inner panel member surfaces and are open whereas the channels 10 of the channel members 3 forming the longitudinal sides of the intermediate panel members B terminate at the end caps 29 and are closed by a suitable cap to retain the insulation material in the body cavity.

The assembled relationship of the components of the intermediate bottom panel modules or members B (or top panels T) is similar to that previously described with respect to the side and end panels SE, and the foam insulation comprises the means for holding these components together without other fastening means being needed. It should be noted that the wedge-shaped channels accommodate a sufficient tapering body of foam material to prevent the edge channel or first members 3,17 from pulling loose from the peripheral margins 2b,16b of the liner or second members and also provide a bonding continuity with the main body of insulation 4. It will also be understood that the so-called wedge-shaped channels may be different configurations, and the term "wedge or keystone-shaped chan-

nels" is intended to cover all such alternate configurations.

Referring now to FIGS. 30 and 31 which illustrate steps in an assembly procedure for the panel system, it will be noted that the end or closure bottom panel members B1 and B6 (and, similarly, the top panels T1 and T6) are formed differently than the intermediate bottom panels B2-5 (and top panels T2-5). Only one longitudinal edge of the panel member B6 (FIGS. 30 and 31) has a T-shaped channel member 3 extending between L-shaped channel members 17 at the short lateral ends of the panel B6, and the other side is provided with an L-shaped channel member 17 formed with mitered corners to form a continuous upwardly opening connecting channel 23 in the upper panel surface (16) extending along the two short ends and outer longitudinal side. The door panels D1, D2 and D3 are similar in construction to the other side and end wall panel members SE, but the dimensions thereof will be determined by the width and height of the door CD.

The assembly or fabrication procedure for all panel modules (SE, B, T and D) is similar and, accordingly, the fabrication of only one such panel member SE will now be described. The edge channel or first members 3 are arranged in a suitable fixture or jig (not shown) to form the rectangular edge framing of the panel SE with the liner or second members 2,2a being positioned between the opposed flanges 6,8 and 6a,8a, respectively. The liners 2,2a are positioned and held against the outer flanges 6 and 6a such as by an opposed vacuum-type supporting platen (not shown) in surface contact therewith and forming a vacuum on the surfaces of the liners 2,2a while completing the supporting fixture to maintain the liners in spaced parallel planes during the foaming process. An aperture (not shown) is formed in one edge member 3 to receive the injection nozzle of conventional froth foaming equipment, and a regulated and predetermined amount of raw polyurethane or like plastic insulation material is injected into the body cavity of the panel member SE according to conventional froth foaming techniques. The nozzle is then removed and the aperture plugged during the period that the expanding foam material essentially fills the voids in, around and between the liners 2,2a and channel members 3 and cures to form a solid bond with the liners and channel members to set the pins 14 in the channel walls 9,9a and form locking wedges in the keystone channels 8,8a to firmly engage the liner margins 2b against the outer edge member lips or flanges 6,6a. When the insulation is cured or set, the plug (not shown) is removed and the aperture may be filled or dressed in a suitable manner.

The respective panel members herein disclosed are assembled together to form the panel system of the walk-in cooler C with the use of spline connecting or locking members S1 (FIG. 6), S2 (FIG. 15), S3 (FIG. 7) and S4 (FIG. 14). The splines S1-S4 are each provided with a body 30 of flat strip steel or the like having a predetermined width, length and thickness adapted to be received in the panel grooves or channels 10,23, the outer edges or margins 30a,30b being provided on the body. As shown in FIG. 6, the spline S1 is provided with a plurality of like pin receiving bayonet slots 31,31a in predetermined spaced relation in the opposed edges 30a,30b thereof, respectively, for guiding and locking

engagement with the cooperating pins 14 of certain channel members 3 of the panel members SE, B, T and D, and the spline S3 is provided with similar pin receiving bayonet slots 32,32a in its opposed edges 30,30a. The spline member S3 is used for locking engagement between cooperating pins 14 of side and end panels SE with cooperating pins 26 of bottom panels B, but not the top panels T.

The bayonet slots 31,31a and 32,32a of splines S1 and S3 each comprises an entry opening 33a to an elongated slot 33b extending lengthwise of the spline members S1,S3 to a rounded pin abutment or seating surface 33c, the entry opening 33a being defined on one side of an angular cam surface 33d connecting with the inner side of the slot 31,32 and the other side of the entry opening 33a has a rounded and inwardly sloping guide surface 33e. In addition, tool slots 34 are centrally positioned adjacent each end of the splines S1 and S3 for use in assembly procedures and using a tool 35, FIG. 37. The tool 35 is formed of rigid sheet steel and has a keystone-shaped working portion 35b with inwardly converging margins 35b for positive engagement in slots 34, and a body 35c with end striking margins 35d for hammer actuation of the tool 35 and the spline member being driven thereby. It will be noted that the slots 31,32 on both splines S1 and S3 are formed on the opposite margins 30a,30b with the pin abutment margins 33c in lateral orientation for direct opposed or lateral alignment of pins 14,26 as will be described, and that the bayonet slots 31 of the spline S1 formed in each margin 30a,30b are oriented in the same longitudinal relationship whereas the slots 32 in spline S3 are offset and reversely formed on opposite sides thereof.

Referring to FIG. 15, the spline locking member S2 is adapted for cooperation only in conjunction with the spline S1 in certain panel installations in which a structural supporting or reinforcing spline is required. The spline S2 is provided with opposed pairs of U-shaped openings or pin receiving slots 36,36a extending laterally inwardly in predetermined longitudinally spaced relationship for releasably securing or locking engagement with the cooperating pins 14 of the panels. Elongated key-ways or slots 36b are provided in the body 30 of the spline member S2 and is of sufficient length to permit relative longitudinal movement of splines S1 into locking engagement.

Referring to FIG. 14, the spline S4 comprises a special final panel locking spline for the header panel member D3 over the door assembly DA illustrating one final closure arrangement for a panel system forming a complete enclosure, such as the cooler C. The spline S4 is a short locking member having only single bayonet slots 37,37a formed in each outer margin 30a,30b thereof similar to the slots 32,32a of the spline S3 and having similar numerals for like identifying parts. However, the slot (37a) on one side of the spline member S4 is extended from the pin abutment margin 33c to the end of the spline to form a marginal edge 30c adapted for end entry into a channel 10 rather than laterally through an entry opening 33a as in splines S1 and S3.

Referring to FIGS. 10, 11 and 22 wherein a typical corner post P is shown, the post P is a square (2×2) wooden center post 40 provided with a suitable outer casing 40a compatible with the panel system finish and,

preferably, a plastic casing is extruded directly onto the post 40. The casing 40a has smooth exterior surfaces 40b on diagonally opposite corners 40c, and a plurality of parallel vertical serrations 40d are formed in each exterior surface immediately adjacent to the other diagonal corners 40e for sealing purposes to be described. The post P is provided with a corner spline locking or connecting member S5 of generally W-shaped configuration utilized for interlocking engagement between adjacent corner-defining panel members SE, the spline S5 having right angularly disposed base walls 41,41a in abutting relation on one of the diagonal corners 40c and being secured to the post P by screws 41b or like fasteners. Rigid steel flange or spline walls 42,42a are formed integral with the base walls 41,41a; respectively, and extend outwardly at right angles thereto centrally of the sides of post P and have free outer margins 43,43a in which a plurality of vertically spaced bayonet slots 44,44a are formed. The slots 44,44a are identical to the slots 31,31a of spline S1 (FIG. 6) and are also laterally aligned and longitudinally oriented in the same direction. It should be noted that the base walls 41,41a of the spline S5 may extend to the ends of the post P, but the ends of spline flanges 42,42a are spaced from each end of the post to obviate interference with the relative sliding locking action of splines S1 and S3 during assembly.

As indicated, the cooler C may include a shelf assembly SA, as shown in FIG. 1, which will comprise at least one shelf 45 supported on shelf brackets 45a vertically adjustably mounted on one or more interior walls of the cooler. It will be understood that neither of the shelves 45 or shelf supporting brackets 45a form a part of this invention, but that suitable standards must be provided to accommodate the attachment to and vertical adjustability of such shelves and shelf brackets on the interior walls. Referring to FIGS. 8 and 9, a combination shelf supporting standard and spline locking member S6 comprises a locking spline or connecting body portion 46 and shelf standard body portion 47, which may be formed separately and welded together or which may be formed as an integral member, as shown. The spline portion 46 is essentially identical in construction to the spline S1 and substitutes therefor where shelves 45 may be desired, and includes outer margins 48,48a in which laterally aligned and longitudinally oriented bayonet slots 49,49a are formed as in spline S1. The shelf standard 47 comprises an elongated tubular member 50 having predeterminedly vertically spaced notches 50a adapted to receive the mounting lugs of a shelf support bracket 45a in a conventional manner, and the tubular standard member 50 is secured to or formed with the spline body 46 intermediate to the margins 48,48a by a connecting web 51 extending normal to the spline flanges on body 47 and of sufficient depth to span one base portion 5,5a from the channel 10 of a side panel member SE to position the spline body 47 in the channel 10 with the tubular standard 50 projecting beyond the panel wall 2. It will be noted that the upper and lower ends of the spline body 46 are shorter than the vertical dimension of the standard portion 47 as in the configuration of the corner post P whereby the upper and lower lateral channels of edge members of the side panels SE interconnected by the spline S6 will not be obstructed for

relative sliding movement of a transversely extending spline member (S1,S3) crosswise of the ends of spline S6. In addition, a top wall CC support plate 52 may be welded or otherwise secured to the upper end of the shelf standard tubular body 50 and web 51, and is provided with openings 52a for supplemental attachment to the top wall panel T as with screws or the like (not shown).

Referring to FIGS. 12 and 13, a similar shelf bracket standard 53 may be provided on a corner post P, the standard having an angular base wall 54 abutting the base walls 41a,41b of a corner spline S5 and being welded or otherwise attached thereto and the web 50a and tubular bracket mounting portion 50 projecting at a diagonal angle to the corner post P.

In connection with the shelf assembly SA and with reference to FIGS. 27, 28, 38 and 39, a novel sealing gasket or cover member G1 is provided for the shelf bracket standard 47,53 to prevent entrapment of foreign matter in the tubular portions 50 and to provide an interior seal of the joints between adjacent side walls SE interlocked by the spline and bracket standard member 36. The cover member G1 is preferably extruded from a suitable flexible plastic, such as Ethylene Vinyl Acetate (EVA), and comprises an imperforate U-shaped body 56 having an interior wall 56a adapted to snugly receive and encase the tubular portion 50 of the shelf standard body 47 and a pair of diverging wing flanges 56b are formed integral therewith and have converging or tapering walls to provide longitudinal sealing lips 56c at the free edges. The U-shaped body 56 and wing flanges 56b are joined by a reduced wall thickness created by a longitudinal recess in the outer walls 56d to increase the flexibility and resiliency of the flanges and sealing lips for firm sealing abutment with the panel member walls 2. The imperforate body 56 is pressed over the tubular standard body 50 and, when the shelf bracket location is determined, a notch or kerf 56e (indicated in broken lines in FIG. 38) is made in the body 56 at the appropriate shelf standard notch 50a.

Referring to FIGS. 16, 17, 22, 23, 24, 26 and 36, the form of novel sealing or gasket member G2 shown is adapted to be utilized in both exterior and interior sealing of vertical joints between adjacent panels and exterior sealing of horizontal joints between adjacent panels. This gasket member G2 is also extruded from a suitable flexible plastic, such as Ethylene Vinyl Acetate (EVA) into elongated sealing strips cut to predetermined length. In cross-section, the gasket member G2 comprises an arcuate outer flange or head portion 57 and an inner body portion 58 formed integral with the head portion 57 at the central portion and extending normal thereto. The head portion 57 has a thicker central portion 57a and the arcuate flange walls 57b converge or taper to form longitudinal sealing lips 57c at the outer free margins. The body portion 58 is also thicker at its juncture with the head portion (58b) and has converging or tapering walls 58b, and a plurality of directly laterally opposed V-shaped sealing lips 58c are formed on the body 58 at an outward angle extending toward the head portion 57.

Referring to FIGS. 18, 19, 22 and 25, another form of novel sealing or gasket member G3 is shown to be utilized in sealing both horizontally and vertically ex-

tending interior corner joints, this gasket member G3 may also be extruded of EVA or the like. The gasket member G3 has an arcuate outer flange or head portion 59 and an inner body portion 60 formed integral with the head portion intermediate its lateral edges. The head portion has a thicker central portion 59a and the arcuate, laterally extending flanges have tapering walls 59b forming longitudinal sealing lips 59c on the free margins. The body portion 60 has angularly related wall sections with a thick wall portion 60a connecting with the head portion 59 and extending normal thereto and a tapering wall portion 60b extending angularly therefrom. A plurality of opposed V-shaped sealing lips are formed on the body portion 60, but are offset relative to each other with a single major lip 60c being formed on the open, obtuse side at the juncture of the wall sections 60a,60b to extend in a plane substantially parallel with the general plane of the head portion 59 and a pair of minor lips 60d being formed on the other side of wall section 60b beyond the major lip 60c from the head section 59 at an outward angle extending toward the head section 59.

In addition to the sealing members G1, G2 and G3, conventional elongated gasket strips or tapes G4 of rectangular cross-section are utilized on certain joints of the panel members B and SE on the exterior sides adjacent to the floor RF and side walls RS of the room and the exterior joints of the ceiling panels T also may be provided with the gasket strips G4 although in many installations, where ample overhead clearance is provided, the gasket member G2 may be used.

Referring briefly to FIGS. 1, 20 and 21, the interior floor of the cooler C may be covered by any suitable planking to prevent concentrated stresses upon the panel members B and translate any forces laterally of the centers of such panels through the edge members 3,17 to the floor RF. For instance, tool grade fiberboard sheets 61, such as Masonite "Benelex" may be used, and the joints between panels and around the periphery may be sealed with a suitable caulking or resilient thermo-expansion material 62.

Referring now to FIGS. 1, 29 and 33, the door assembly DA comprises a main exterior frame 63 having side and header frame members 63a and 63b, respectively, formed of extruded fiberglass, plastic or the like compatible with the cooler panel construction. The frame members 63a,63b have foam insulation sections 64 and a wooden core section 64a separated by mulions 64b, the wood core 64a comprising a mounting post for the door CA, and plural hinge bases 65 being secured thereto. A peripheral flange 66 is formed to abut the adjacent door panel D1, D2 or D3 and a rubber adhesive seal tape 66a is provided therebetween. The exterior frame 63 is secured in place with the panels D1, D2 and D3 by an interior T-shaped frame 67, such as an aluminum extrusion having side and header members 67a and 67b, respectively, with outer peripheral flanges 67c abutting the panels D1, D2 and D3 in opposed relation with the flanges 66 and inner flanges 67d secured to the outer frame 63 by molyjacks and machine screws 68 or the like. Rubber adhesive sealing tape 68a is also applied between the flanges 67c, 67d and the panels D and outer frame 63, respectively.

The cooler door CD is similar in construction to the panel members D, SE, B, and T, comprising spaced casings, or liners 70, 70a and peripheral edge members 71 having spaced outer and inner flanges 72, 72a and 73, 73a, respectively, and an insulation body 74 of polyurethane foam or the like. The edge members 71 are substantially L-shaped forming an outer flange area 71a overlapping the door frame assembly DA and a main body (74) of substantial thickness. Rigid plates 75 and 75a are secured together and mounted in the flange area 71a of the door to provide for mounting either edge or butt hinge members 76 to the door CD. A flanged recess 77 is formed in the edge members 71 peripherally around the door CD and a resilient accordion gasket 78 has a wedge or arrow-shaped mounting element 78a seated in the recess 77 in engagement with the flange walls 77a. The accordion gasket 78 carries a strip magnet 79 for sealing engagement with a channel member 80 of stainless steel applied to the opposed wall of door frame 68 and housing anti-sweat heaters 80a. A handle 81 is provided on the door CD.

ASSEMBLY OF THE PREFERRED EMBODIMENT

Referring now particularly to FIGS. 1, 20-28 and 30-35, an assembly procedure for the panel system embodied in cooler cabinet C will now be described although believed to be readily apparent from these sub-assembly and assembly figures of the drawings. The assembly of the cooler C preferably begins in the corner of a room R or along a side wall RS thereof in the desired construction area and logically would commence with bottom panels B1 and B2, but the other end closure and bottom panels B6 and B5 are illustrated in FIG. 30 and description of their assembly will also have reference to panels B1 and B2, respectively.

In the cooler assembly, the bottom closure panel B6 is positioned in its desired location on the floor RF with the panel B5 adjacent thereto and their longitudinal edge members 3 in opposed relation, and the desired lengths of sealing tape or gasket G4 is applied in sealing engagement over the serrations 15, 15a of the edge members 3 next to the floor (FIG. 20). Spline members S1 and S2 are then inserted laterally into the groove 10 of the panel B6, spline S2 having its grooves 36a received on the pins 14 and spline S1 having its access openings 33a oriented on the same pins 14. Although two short sections of the spline S2 are shown, a single long spline may be provided as it is laterally engaged with the panels (B) to stabilize against relative longitudinal movement, whereas two short sections of spline S1 are used in securing the bottom panels B6 and B5, etc., together. The panel B5 is then moved laterally against the panel B6 so that the splines S1 and S2 are received in the channel 10 thereof and the access openings 33 and grooves 36 are oriented on the pins 14 therein. The locking tool 35 (FIG. 37) is inserted in the joint between the panels with its key portion 35a positioned in the slot 34 of one short spline S1 and slidably received in the key groove 36b of spline S2, and the tool 35 is driven longitudinally so that the opposed pins 14 in the slots 31, 31a are cammed together along the guide surfaces 33e and positioned on the pin abutment surfaces 33c. The other spline S1 is then engaged with pins 14 of the opposed panel members and, as shown by arrows in FIG. 30, the splines S1 are reversely

oriented to be moved in opposite directions (toward each other) to cooperate with the spline S2 against racking or relative lateral or longitudinal movement of the panels B6 and B5. The sealing strips G4 are thus drawn together into sealing engagement in the locked condition of the panels B6 and B5.

The remaining bottom panels B4, B3, B2 and B1 are then sequentially arranged and interlocked with each other in the same manner to form a first series of panels of the cooler panel system. As indicated in FIGS. 1 and 31, the assembled floor or bottom wall CF will have its exterior defined by the edge members 17 thereby forming a smooth exterior wall surface 19 and a continuous upwardly opening channel 23 adjacent to the outer wall 19 in the upper surface of the bottom wall CF about the periphery thereof.

Referring to FIGS. 1 and 31, the side and end walls CS and CE are assembled on the bottom wall CF beginning in one corner of the cooler C. The assembly of these panel members SE and posts P will be described commencing with the panels SE1 and SE2 and the post P1, and proceeding in a counterclockwise direction, although the assembly may begin in any corner and preferably will be on the side or end wall in which the door assembly DA is provided and preferably will commence on a corner adjacent to a side wall RS of the room R and the assembly proceed along such side wall RS, as in a clockwise direction beginning with panels SE 10 and 11 and corner post P4.

In the assembly of side and end panels SE, short spline members S3 are positioned in the channel means 23 adjacent to and extending from the corner (P1) with the access openings 33a of the lower slots 32a being oriented on the pins 26. The panels SE1 and SE2 are then placed in a vertical position over the splines S3 and the pins 14 of the lower lateral edge members 3 oriented in the access openings 33a of the offset and reversely formed upper slots 32 whereby the panels SE1 and SE2 are adjacent to, but spaced laterally away from their final assembled position with the corner post P1. One of the panels (SE1) is pushed in a direction toward the corner and such sliding panel movement along the spline S3 causes the pins 14 to be cammed into the upper slots 32 and thus translate such movement to the spline S3 to cam the pins 26 into the lower slots 32a and bring the panel member SE1 into its final assembled position.

The corner post P1 is then held in an elevated position spaced above the bottom panel B6 and the spline wall 42 of corner spline S5 inserted into the longitudinal vertical channel 10 of panel SE1 with the access openings 33a of slots 44 being oriented on the pins 14. The corner post P1 is held in this position while end panel SE2 is placed on its spline S3 and moved laterally toward corner post P1 into final position to be interlocked with the bottom panel B6, as previously described with respect to side panel SE1, and to orient its vertically spaced pins 14 in longitudinal channel 10 in the access openings 33a of the slots 44a of spline wall 42a. The corner post P1 is then driven downwardly to cam the pins 14 on adjacent panels SE1 and SE2 into the bayonet slots 44, 44a of the corner spline S5. It will now be apparent that the cooperable action of the bayonet slots with the respective pins 14, 26 draws the adjacent panel members firmly together in an interlocked

relationship and that the initial corner assembly of panels SE1 and SE2 with post P1 is self-supporting so that the sequential assembly of side and end panel members SE3-SE12 with the corner posts P2-P4 can proceed, as now described.

With reference to FIG. 32, the next end panel SE3 is positioned in offset relation on another short spline S3 oriented on pins 26 in the longitudinal channel 23 of bottom panel B6 and long splines S1 and S2 are vertically oriented in the longitudinal channel 10 of the panel SE2, the spline S2 being moved laterally into final assembled position with its grooves 36 being received on the pins 14 and the spline S1 being raised to orient the access openings 33a on the same pins 14. The end panel SE3 is then moved laterally toward the panel SE2 to cam the short spline S3 into interlocking relationship between the bottom panel B6 and the end panel SE3, and the vertical splines S1 and S2 are thus received into the longitudinal groove 10 and oriented on the pins 14. Spline S1 is driven downwardly to effect the final interlocking action between the end panels SE2 and SE3.

As indicated, the same procedure is followed in assembling corner post P2, the sequential series of side panels SE4-SE8 of the side wall CS, the corner post P3, the sequential series of end panels SE9 and SE10, the corner post P4 and the side wall panels SE11 and SE12. Similarly, the panel members D1 and D2 are moved laterally into assembled interlocked position with the adjacent side panels SE12 and SE1, respectively, leaving only the assembly of panel D3 to complete the side and end wall enclosure of the cooler C.

The panel D3 must be vertically moved into position between panels D1 and D2 and interlocked therewith and special splines S4, see FIGS. 14, 33 and 34, illustrate this procedure. As shown, the panel D3 has short vertical sides with two pins 14 in the channel 10 (although only one such pin may be provided in some panel systems) and, as in other side and end panels SE and D, all channels 10 extend straight through to the outer edges of the panel to permit a spline to be inserted from the channel end. Accordingly, the spline S4 has the "open" slot 37a formed on one side with a straight wall 30c extending to the end of the spline from the pin seating margin 33c. A spline S4 is positioned with its normal slot 37 on the second pin 14 from the top in vertical groove 10 of each panel D1 and D2 with the open slot 37a facing upwardly to be received in the opposed vertical channels 10 of panel D3 for engagement with the lower pin 14 therein. Another spline S4 is inverted or reversely positioned with its normal slot 37 being received on the upper pin 14 of each side channel 10 of the panel D3, and these splines S4 are held in place as the panel D3 is moved vertically downwardly between the opposed panels D1 and D2 to bring the oppositely acting splines into final interlocking orientation between these panels.

The door assembly DA will usually constitute the last step in the structural assembly procedure except for application of certain sealing members G1, G2 and G3 and the top wall CC assembly will next be described.

Referring to FIGS. 1 and 35, the top panel members T1-T6 are assembled in a similar sequential series as the bottom panels B1-B6, and preferably the assembly will commence with the end closure T1 adjacent to the

side wall RS of the room R. However, as shown in FIG. 35, the procedure will be described beginning with the panel T6.

Two short splines S1 are oriented in outwardly spaced relation in the laterally extending end channels 10 of the end panels SE2 and SE3 with the access openings 33a of lower slots 31a being located on the pins 14 and longer splines S1 are likewise positioned in the upper channels 10 of the side panels SE1 and SE4. The panel member T6 is positioned over these side and end walls with its channel 23 facing downwardly and the upper slots 31 of the splines S1 are thus directly oriented with the pins 26 therein. The tool 35 is again used to drive the end wall splines S1 relatively toward each other (or away from each other) to cam the pins 14 and 26 into the slots and interlock the top panel T6 with the end wall panels SE2 and SE3, but the other splines S1 on the side panels SE1 and SE4 are not set at this time.

The next step in top wall assembly is to position the next set of splines S1 in the upper channels of side wall panel members and to position short splines S1 and S2 (or one long spline S2) in the longitudinal channel 10 of edge member 3 of the panel T6. The panel member T5 is then positioned with its channels 23 of the lateral edge members 17 downwardly to receive the side wall splines S1 and its longitudinal channel 10 being opposed to the corresponding channel 10 of panel T6 in position to receive the splines S1 and S2 therein. It should be understood that the pins 26 of the top panel edge members 17 are not oriented with the spline slots 31, but there is sufficient flexibility that the panel T5 can be moved laterally to receive the splines S1 and S2 in its channel 10 to bring the pins 26 into vertical alignment with the access openings 33a of the side wall splines S1. Accordingly, the short splines S1 in the opposed longitudinal channels 10 of the top panels T5 and T6 may be driven toward (or away from) each other using the tool 35 and the first set of side wall splines S1 overlapping the top panels T5 and T6 can then be driven toward the corner posts P1 and P2 to cam the pins 14, 26 into the slots 31, 31a to interlock the panel T6 and adjacent portion of panel T5 with the side wall panels SE1 and SE4.

The same procedure is utilized for assembly of the sequential series of top panels T4, T3, T2 and T1, except that the side wall splines S1 for the panels T2 and T1 will not be interlocked until the short end panel splines S1 are oriented into the upper channels 10 of panels SE9 and SE10 so that the final orientation of panel T1 will also bring its longitudinal channel 23 and pins 26 into alignment with the end splines S1 and slot openings 33a therein. The last side and end wall splines S1 are set with the tool 35 to complete the top assembly.

From the foregoing it will be apparent that the basic panel system includes a series of sequentially positioned and interlocked bottom panels B1-B6, a series of sequentially positioned and interlocked side and end panels SE1-SE12 and D1-D3, and a series of sequentially positioned and interlocked top panels T1-T6. It will be noted again that the short end closure bottom and top panels B1, B6, T1 and T6 establish connecting joints in each sequential series of panels that are laterally offset from the next connecting series of

panels for added strength, and the interlocking spline members S3 between the bottom wall panels B1-B6 and side wall panels SE1-SE12 and D1-D3 are longer and traverse the joints to further stabilize the panel system. As indicated, the splines S5 of the corner posts P1-P4 have short spline walls 42,42a spaced from the ends of the posts (P) to permit lateral movement of the splines S3 at the lower ends and the splines S1 at the upper ends. Similarly, in constructions where shelf assemblies SA are desired, the splines S6 are shortened at both ends to permit lateral movement of the splines S3 and S1 at the lower and upper ends thereof. The spline S2 may be utilized with the splines S6 for shelf assemblies SA as shown, although usually not required due to the weight factor on the shelves that obviates racking or lateral stresses in adjacent panels secured by the splines S6. It will also be apparent that the sealing gasket G4 will be applied to the appropriate edge members 3 and 17 of bottom, side and end panels to be positioned adjacent to floor or side walls RF and RS of a room R, and likewise on the top panels adjacent to the room ceiling and affording limited overhead clearance for other sealing gaskets.

The floor panels 61 and sealing compound 62 are installed in appropriate panel systems, preferably before the door assembly DA is installed and the sealing compound will eliminate the need for use of sealing gaskets G3 at the bottom inside seams or joints and the gasket G2 on the bottom panel joints. The door assembly DA is provided with the resilient seals 66a,68a on the flanges 66 and 67c,67d and is assembled together as previously described and the door CD mounted on the hinge means 65, 76 to complete the cooler cabinet C.

Referring again to FIGS. 1, 22-28 and 36, the sealing gasket members G1-G4 are applied to the assembled cooler cabinet C as indicated hereinbefore. The sealing strips G4 are applied prior to assembly of the adjacent panel members for subsequently inaccessible joints, and the shelf standard gaskets G1 are snapped into place over the standards 49,53 before setting the shelf brackets 45b and shelves 45 with the spaced sealing lips 56c flaring outwardly and yieldably bearing against the adjacent panel walls 2.

The gaskets G2 are applied to all horizontal and vertical exterior joints between adjacent panels by pressing the body portion 58 directly into the joint to compress the opposed sealing lips 58c during application, the lips 58c then resiliently springing outwardly and being engaged with one of the multiple serrations 15,15a of the edge members 3, the serrations 28 of the edge members 17 or the serrations 40d of the posts P. The outer sealing lips 57c of the head portion 57 of gasket member G2 bear against the outer walls 2a,19 of the panels. The gaskets G2 are also applied to the vertical interior joints of the cooler C in the same manner.

Similarly, the gaskets G3 are applied to interior vertical and horizontal corner joints by inserting the body portion 60 into the joint so that the sealing lips 60d are engaged with serrations 15,15d and the major lip 60c bears against the opposed surface of edge member 17 with the head portion lips 59c being pressed into yieldable sealing contact with the inner panel liners 2,16 adjacent thereto.

From the foregoing, the construction and assembly of a typical panel system embodying the invention will

be readily apparent, as will the fact that partition wall systems and other arrangements utilizing straight-line or angularly-related wall structures may also embody the concepts and construction or assembly techniques herein set forth. For instance, straight or angular channel members may be provided for direct attachment to floors, walls or ceilings of a room and similar panels, splines and sealing members applied thereto. Accordingly, the scope of the invention is only to be limited by the scope of the claims which follow as such changes, modifications and adaptations will be readily apparent to all skilled in the art.

What is claimed is:

1. A panel module for a panel system of the type described comprising an edge forming member including a base wall having laterally spaced outer edges, and adjacent flanges connected to said base wall in opposed spaced-apart relation and being relatively angularly related to each other defining a wedge-shaped channel therebetween, a liner member having an edge margin disposed between said flanges and being in surface abutment with one of said flanges and spaced from the other of said flanges, and bonding means comprising foam insulation material that is expanded into said channel between the other of said flanges and said liner member and hardened in bonding engagement therein to maintain said edge forming and liner members together.

2. The panel module according to claim 1, wherein said spaced-apart flanges include a first flange extending from adjacent to one lateral edge of said base wall substantially in the plane of said liner member and a second flange extending from said base wall angularly and adjacent to said first flange.

3. The panel module according to claim 2, including another pair of angularly disposed spaced flanges formed adjacent to the other lateral edge of said base wall to define another wedge-shaped channel, and another second liner member positioned in surface abutment with the outermost of said other pair of flanges and maintained therein by said bonding means.

4. The panel module according to claim 3, in which said liner members extend from said first-mentioned and other wedge-shaped channels in predetermined spaced parallel planes forming opposite and substantially planar surface walls of said panel module, and said foam insulation material forms the sole means for interlocking said edge forming and liner members together.

5. The panel module according to claim 1, wherein said base wall of said edge forming member is separated into laterally spaced segments, and opposed walls being formed on said base wall segments and extending normal thereto to define an elongated recessed central channel extending substantially throughout the length of said edge forming member.

6. The panel module according to claim 5, in which a rigid strip of reinforcing material is positioned within each of said opposed channel forming walls.

7. The panel module according to claim 5, in which a cross wall interconnects said channel forming walls and defines the bottom of said central channel, and said cross wall is provided with lateral protrusions extending beyond said spaced channel forming walls toward said pairs of flanges and in spaced relation with said base wall segments.

8. The panel module according to claim 5, in which said opposed walls have laterally aligned openings, and a plurality of laterally extending pin means being positioned in said openings in predetermined longitudinally spaced relationship across the central channel of said edge forming member.

9. The panel module according to claim 8, in which said edge forming member is T-shaped in cross-section and said opposed channel walls extend perpendicularly from said base wall segments to define said central channel, and said spaced-apart flanges being formed on the lateral edge of at least one base wall segment remote from said central channel.

10. The panel module according to claim 8, in which said edge forming member is L-shaped in cross-section and said laterally spaced base wall segments are in the plane of said liner member with adjacent edges from which opposed walls extend perpendicular to define said central channel, and an end wall extending normal to the plane of said liner member from the lateral edge of at least one base wall segment remote from said central channel.

11. An insulated panel comprising a pair of opposed liner means each having opposed pairs of marginal edge portions, at least one edge portion of one of said liner means being juxtaposed with one edge portion of the other of said liner means, opposed pairs of edge members connected in end-to-end framing relation between said liner means in enclosing engagement with said opposed pairs of edge portions thereof, a body cavity formed between said liner means and said edge members, at least one of said edge members including a base wall extending between said liner means and substantially normal thereto, a pair of opposed side walls integral with said base wall, a pair of flange means integrally connected with said base wall adjacent to said side walls and defining therewith a pair of substantially wedge-shaped channel means open to said body cavity, one edge portion of said one and other liner means being respectively received in said channel means and engaged with said side walls, and an integral mass of insulation material in said body cavity and extending into said channel means in bonding relation between said liner means and edge members for preventing displacement of said one edge member from said panel.

12. An edge member for an insulated panel comprising an extruded plastic body of preselected length, a base wall on said body having interior and exterior sur-

faces and laterally spaced outer margins, a pair of outer side walls integrally formed on the outer margins of said base wall defining the width of said edge member, flange means integrally connected with the interior surface of said base wall adjacent to each of said side walls and angling from said base wall toward said side wall to define a wedge-shaped channel therebetween, said base wall including a pair of opposed second wall means integrally connected with said base wall adjacent to the mid-portion thereof and laterally spaced from said outer side walls, a cross wall integrally connected between said wall means and spaced from said base wall, said wall means and cross wall defining a continuous elongated central channel extending substantially throughout the length of said base wall, a plurality of opposed and aligned aperture means in said second wall means, and being predeterminedly longitudinally spaced from each other lengthwise of said body, and a plurality of pin means received in said plural opposed aperture means and extending across said central channel.

13. A modular insulated panel enclosure having a controlled environment, comprising a first series of horizontally disposed panel members forming a bottom wall, a second series of vertically disposed panel members forming opposed side and end walls, a third series of horizontally disposed panel members forming a top wall, corner members disposed between adjacent side and end walls, door assembly means in one of said side and end walls, adjacent panel members in each of said first, second and third series having continuous opposed channel means with a plurality of longitudinally spaced pins therein, first spline members having slots engaged with said pins in opposed channels and interlocking said adjacent panel members together, second spline members on said corner members in interlocking relationship between adjacent side and end wall panels, shelf means including vertical shelf mounting standards connected with certain of said spline locking members and positioned adjacent to the interior surfaces of said second series of panel members substantially at the juncture of adjacent panel members, yieldable sealing members having plural sealing lips sealably engaged between adjacent panel members of said first, second and third series and other sealing means covering said shelf standards and having spaced wing flanges with sealing lips engaged against said interior surfaces adjacent to the juncture of adjacent panel members.

* * * * *