# United States Patent [19]

**De Schutter**

[11] **3,866,377**

[45] **Feb. 18, 1975**


[54] **WALL PANEL SPACER**


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[73] Assignee: **Perfect Module Systems, Inc.,** Mt. Clemens, Mich.



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[52] **U.S. Cl.** ..... **52/508,** 52/220, 52/281, 52/712

[51] **Int. Cl.** ..... **E04b 2/30**

[58] **Field of Search** ..... 52/582, 238, 241, 242, 52/758, 285, 281, 479, 758 D, 275, 624, 508, 614, 712, 716, 717, 718, 220



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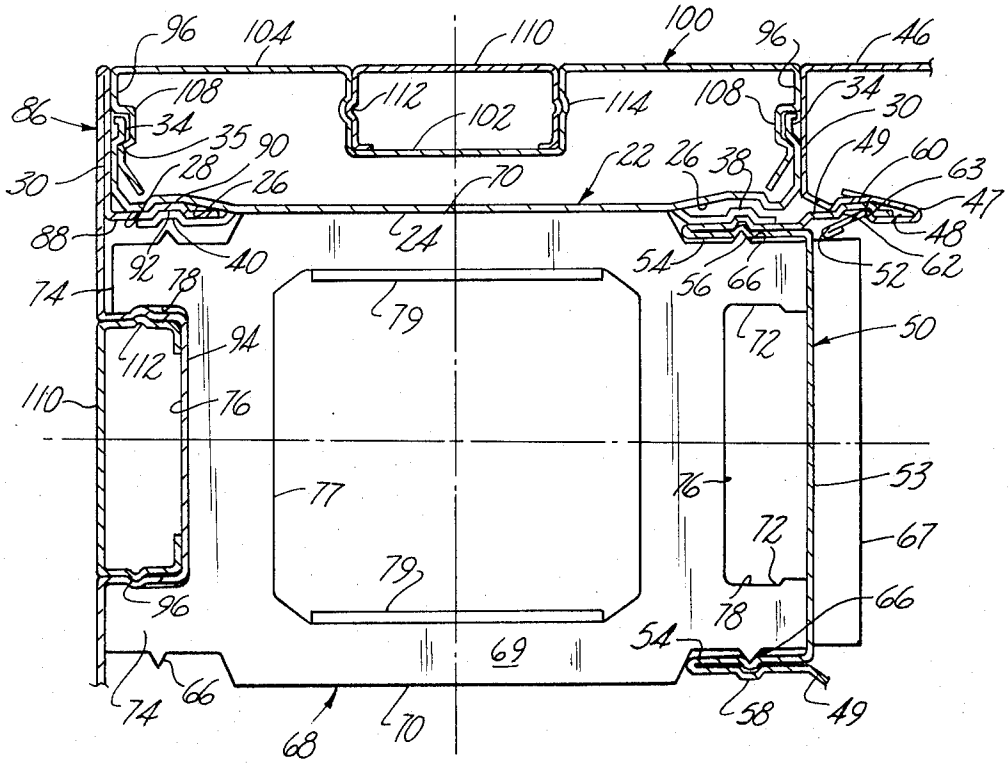
*Primary Examiner*—John E. Murtagh
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[57] **ABSTRACT**

A wall panel system having a plurality of spaced, parallel panel sections that are connected at opposite ends by a panel joint to form a wall panel. The panel system includes a spacer having a body portion with parallel outer edges and inwardly spaced and outwardly extending pairs of arm members paralleling the body edges. The outer edge of each of the arm members has a notch portions which are inwardly spaced from the body edges to define a snap lock means. The inner opposing edges of each pair of arms define a recess having therein between second snap lock means. Central portions of the body section are deformed to define outwardly extending tabs, the edges of which parallel the body portion edges. The panel system also includes a second spacer means of a T-shaped configuration having a base with rounded edges extending to the mid-section of the base and downwardly therefrom to define the legs of the T-shaped member. The downwardly extending legs at the mid-section are spaced a predetermined distance to define a spacer receiving neck portion and the legs therebeyond are outwardly deformed to define on the opposing inner surfaces thereof, notches which in conjunction with the first mentioned spacer form a snap lock arrangement. The outside face of the base is in abutment with the inside surface of the panel section and the base surface is roughened for bonding purposes with the panel section.


**5 Claims, 5 Drawing Figures**



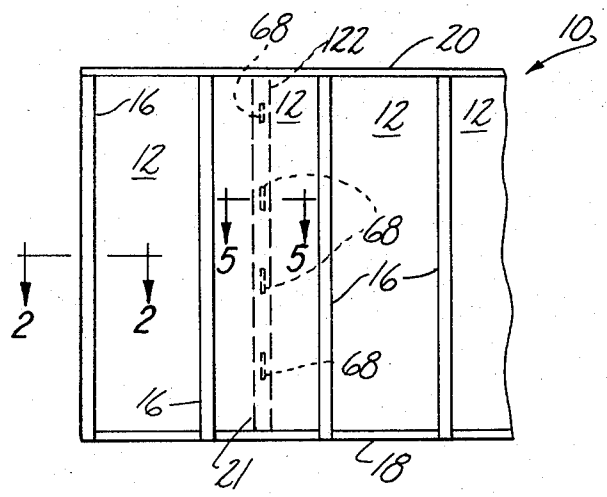

68
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21
18

Fig -1

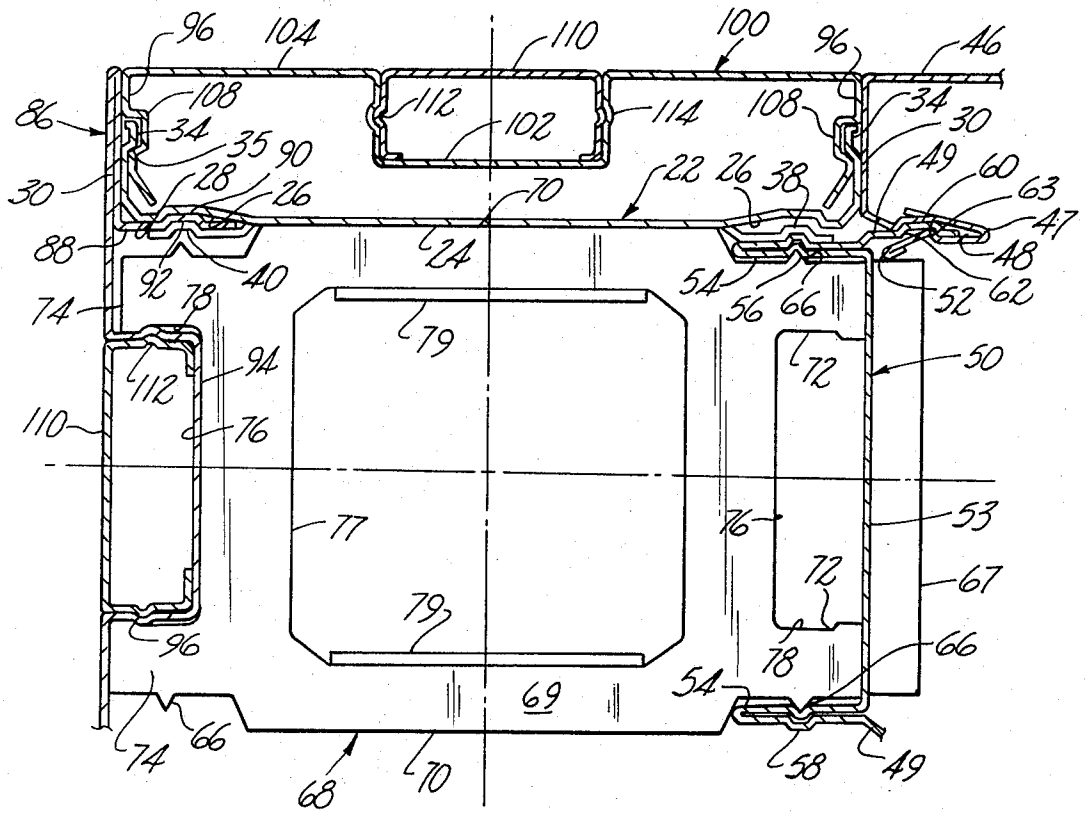

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Fig -2

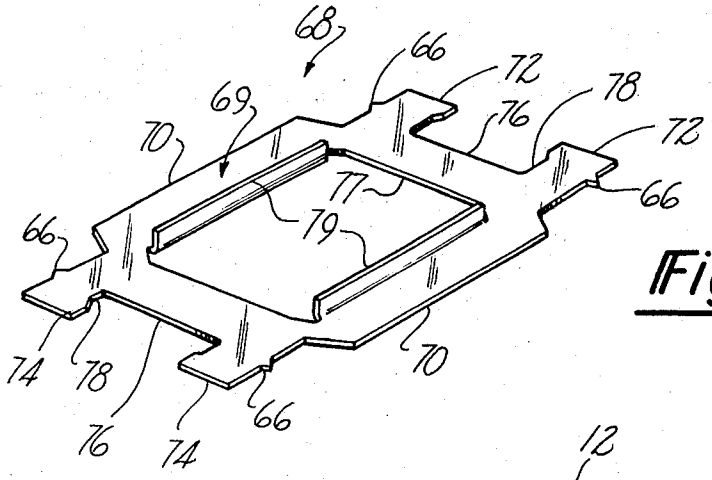



Fig - 3

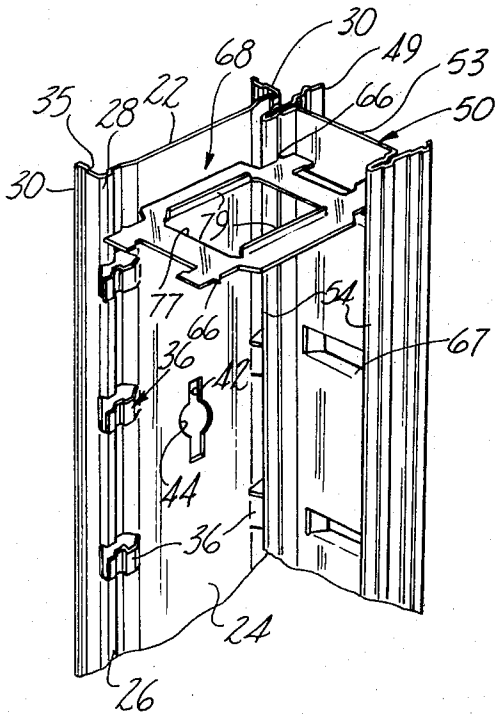



Fig - 4

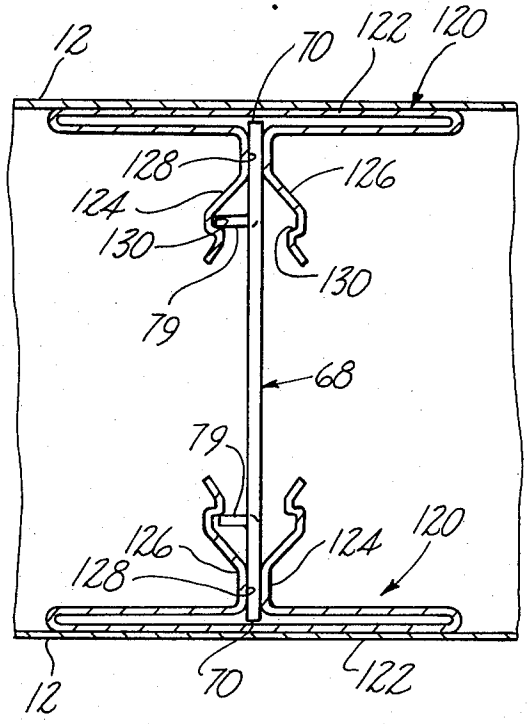



Fig - 5

# WALL PANEL SPACER

## CROSS REFERENCE TO RELATED PATENT APPLICATIONS

The present invention is related in its substance to co-pending U.S. Pat. application Ser. No. 91,083, now U.S. Pat. No. 3,805,471, filed Nov. 19, 1973 for "Building Panel Construction System" in the name of Camiel R. De Schutter.

## BACKGROUND OF THE INVENTION

I. Field of the Invention

The present invention relates to building wall panel systems and, in particular, to a spacer utilized in maintaining different components of the wall panel system in a spaced parallel relationship.

II. Description of the Prior Art

Heretofore, numerous devices and apparatus have been employed in the construction of wall panel systems in order to facilitate the simple, rapid and inexpensive fabrication of a wall. Samples of the prior art systems and structures which have heretofore been utilized are disclosed in U.S. Pat. No. 3,034,609, U.S. Pat. No. 3,609,933 and U.S. Pat. No. 3,622,3290. Other examples of such systems are disclosed in Belgium Pat. No. 511174. Although these systems provide apparatus and methods for the fabrication of wall panel systems, they are deficient in certain critical aspects, including the lack of versatility of the components thereof to be utilized, in different areas of the system and, in particular, these systems do not provide a rigid and stable wall panel system without the need for intricate and expensive components requiring complicated and time consuming means for fastening the various components to one another.

## SUMMARY OF THE INVENTION

The present invention which will be described subsequently in greater detail comprises a spacer adapted to cooperate with various components of a wall panel system, such that the spacer is utilized in different orientations and positions to provide a finished panel system having a more rigid and stable construction.

It is therefore an object of the present invention to provide a new and improved spacer utilized in the fabrication of wall panel systems.

It is a further object of the present invention to provide a new and improved spacer for maintaining different components of a wall panel system at predetermined spaced distances with the spacer being used at different locations throughout the system and having means for engaging the various components so that the spacer functions to connect the space components as well as insuring a proper spaced relationship between the connected components.

It is still a further object of the present invention to provide a spacer having means to facilitate the use of wiring and conduits within the wall panel system.

Other objects, advantages and applications of the present invention will become apparent to those skilled in the art of wall panel systems and, in particular, to spacer means utilized in such systems when the accompanying description of several examples of the best modes contemplated for practicing the invention is read in conjunction with the accompanying drawings.



## BRIEF DESCRIPTION OF THE DRAWINGS

The description herein makes reference to the accompanying drawings wherein like reference numerals refer to like parts throughout the several views, and in which:

FIG. **1** is a plan elevational view of a building wall panel system having components which are constructed in accordance with the principles of the present invention;

FIG. **2** is an enlarged fragmentary cross-sectional view taken along line **2—2** of FIG. **1**;

FIG. **3** is an enlarged perspective view of a spacer utilized in the assembly of the wall panel system illustrated in FIG. **1**;

FIG. **4** is a fragmentary perspective view of the wall panel system illustrated in FIG. **2** with parts thereof removed for clarity; and

FIG. **5** is a fragmentary enlarged cross-sectional view taken along line **5—5** of FIG. **1.**

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings and, in particular, to FIG. **1,** wherein there is illustrated a building wall panel **10** comprising a plurality of outer panel sections **12** separated by panel section joints **16.** Along the bottom edge of the wall **10** there is provided a base moulding **18,** while a trim moulding **20** is provided along the upper edge of the wall panel **10** adjacent the ceiling of the room in which the wall panel **10** is employed. Although the system is illustrated in conjunction with a room wall, it is to be understood that the present invention is equally applicable for use in the external walls of a building and in walled structures which are not part of a building. The wall panel system has in between opposing panel section **12,** longitudinally disposed support assemblies **21** which function to provide lateral support for the panel sections **12** between the support post **16,** all of which will be described in greater detail hereinafter.

Referring now to FIGS. **2, 3** and **4** of the drawings, wherein there is illustrated fragmentary views of the section joint **16** located at the end of the wall panel **10.** Each panel section joint **16** comprises a pair of vertical retainer members **22** which are disposed on opposite sides of the wall panel **10** and only one of which is illustrated. The retainer member **22,** as can best be seen in FIG. **4,** is U-shaped in cross section and comprises a base portion **24,** having a longitudinal recesses **26** formed on both sides of the base **24** and extending the full length of the retainer member **22.** Each longitudinal recess **26** terminates in upwardly extending wall that forms a longitudinal rib **28** which similarly extends the full length of the retainer member **22** on both outer edges of the base **24.** The U-shaped retainer member **22** has legs **30,** which are deformed at their ends to define longitudinal extending shoulders **35,** for a purpose to be described hereinafter. At strategic locations along the full length of the retainer member **22** and on opposite sides of the base **24,** there are provided punched out tabs **36** which traverse the recess **26** and ribs **28,** defining sidewardly facing openings adapted to receive portions of adjacent panel members in a snap lock fashion as will be described hereinafter. Part of the snap lock arrangement of the retainer members is formed by an inward deformation of each tab **36,** wherein a rib **38**

is formed on the inner face of each tab **36** and a recess **40** is formed simultaneously on the outside of each tab **36.** The manner in which the longitudinal recess **26,** rib **28** and the rib **38** of the tabs **36** co-act to form the compressive snap lock for the retainer member **22** will be described hereinafter with reference to FIG. **2.** It should be also noted that the snap lock feature obtained by means of the recess **40** on the outwardly facing sides of each tab **36,** will similarly be described hereinafter.

As can best be seen in FIG. **4,** the retainer member **22** is provided at strategic locations along the full length of the retainer member **22** with a plurality of longitudinally disposed slots **42** having enlarged circular sections **44.** A suitable fastening means, such as the fastening clip described in copending U.S. Pat. application Ser. No. 314,416, dated Dec. 12, 1972, is inserted within the slot **42** of the two opposing members **22,** to fasten the two members together. Since the fasteners utilized to join the retainer members **22** forms no part of the present invention herein, a further detailed description of the same will not be had.

As can best be seen in FIG. **2,** the outer panel sections **12** are joined to each of the retainer members **22** by means of a panel section coupling member **46,** which is generally U-shaped in cross section and extends the full length of the wall panel. The panel section coupling member **46** has U-shaped end section **47** defining therein between a snap lock receiving groove **48,** within which is inserted in a snap lock fashion, one leg **49** of a retainer coupling member **50.** The end **52** of the leg **47** is bent outwardly toward the central portion of the retainer coupling member **50** for a purpose to be described. Although not shown, the panel section coupling member on the opposite side of the wall panel has a end **52** which similarly is bent outwardly toward the central portion of the retainer coupling member **50.**

Still referring to FIGS. **2** and **4,** the retainer coupling member **50** is illustrated as having a H-shaped cross section with a base **53** and outwardly extending legs **54** that are rounded at their ends and which extend rearwardly and outwardly beyond the base **53** to form the aforementioned legs **49.** The legs **54** are both deformed to define opposing longitudinal recesses **56** on the inner side of each legs **54** and longitudinally disposed ribs **58** on the outer surface of each leg **54.** The recess **56** and rib **58** extend the full length of the leg on the outside thereof. The extended legs **49,** as can best be seen in FIG. **2,** are inclined outwardly and deformed to define on the outer side of each leg, longitudinal ribs **60** and longitudinal recesses **62** on the inner sides thereof. As can best be seen in FIG. **2,** the snap lock grooves **48** of each panel section coupling member **46** receive the extended legs **49** of the retainer coupling member **50** in a snap lock engagement with the rib **60** of each leg engaging a mating recess **63** formed in each leg **47** of the coupling member **46,** while a notch portion of the rounded leg **47** engages the recess **62** on the inner side of each leg **49.**

As can best be seen in FIG. **4,** the base **53** of the retainer coupling member **50** is provided with a plurality of longitudinally spaced punched out sections forming tabs **67,** each having a width which is substantially equal to the width of the base **53.** After the panel section coupling member **46** is attached to the retainer coupling member **50,** as aforementioned, the tabs **67** along the full length of the retainer coupling member **50** are bent outwardly toward the legs **47.** The legs **47** are so designed that after they couplingly engage the **49** leg of the member **50,** the ends **52** project inwardly toward the base **53** of the coupling member **50,** and when the tabs **67** are bent outwardly and downwardly, the sides edges thereof slidably engage the ends **52** of the leg **47** to force the same outwardly into a compressive fit with the recesses **62** to insure a tight and rigid coupling of the two members.

As can best be seen in FIG. **2,** the legs **54** of the retainer coupling member **50** have their respective ribs **58** in engagement with the recesses **40** of the retainer member tabs **36** and are retained therein by the compressive action of ribs **66** formed on a portion of a panel spacer **68.**

The spacer **68** which is illustrated in perspective in FIG. **3** comprises a body section **69** having parallel outer edges **70.** The opposite sides of the body section **69** have outwardly extending spaced, parallel pairs of arms **72** and **74.** The aforementioned ribs **66** are formed on the outer edges of the arms **72** and **74** with the outermost portion of the rib **66** being inwardly spaced from the parallel edges **70.** The opposing edges, respectively, of the arms **72** and **74** define a recess **76** with the opposing inner surfaces of the arms **72** and **74** having inward deformations which form grooves **78** for a purpose which will be described hereinafter. The central portion of the body section **69** has an aperture **77** with two of the parallel edges of the aperture **77** being bent outwardly to define outward extending tabs **79,** the upper edges of which parallel the edges **70** of the body section **69.** The spacer **68** is disposed between the two opposing retainer members **22,** and thus, when the retainer members **22** are locked together by means of the aforementioned fastening means, the retainer members **22** are forced together in abutment with the outer edges **70** of the spacer **68** while the ribs **66** on opposite sides of the spacer arm **72** and **74** project into the recesses **56** of the retainer coupling member **50.** Thus the spacer **68** secures to the retainer members **22** to the retainer coupling member **50** while functioning to properly space the retainer members **22** and stiffen the panel joint **16.**

As can best be seen on the left hand side of FIG. **2,** the ends of the wall panel sections **12** are enclosed by a panel end cover **86** which is provided with a pair of inwardly extending legs **88** (only one of which is shown) having a deformation formed thereon to define a rib **90** and recess **92** which, when inserted between the tab **40** and recess **26** of the retainer member **22,** engages the same in a snap lock fashion to secure the end cover **86** to the panel sections **12.** A central U-shaped recess **94** at the center of the panel end cover **86** is provided with outwardly extending ribs **96** that engage in a snap like manner with the complimentary U-shaped recess **78** formed between the spacer arms **72** and **74** whereby the spacer **68,** the end cover **86** and the retainer members **22** are secured to one another. It should be noted that the panel joints **16** between the panel sections **12** differ from thee end panel joint **16** in that the cover **86** is replaced by a retainer coupling member **50** and the same engages the retainer members **22** in the same manner as aforementioned.

A joint cover **100** of a generally U-shaped configuration has a central recess **102** extending the full longitudinal length of its base **104** with the legs **96** thereof having recesses **108** that are engagable with the deforma-

tion **34** on the legs **30** of the retainer member **22** to secure the joint cover **100** in position.

Joint cover inserts **110** are provided respectively, for insertion within the recess **102** of the joint cover **100** and the recess **94** of the end cover **86,** as shown. The joint cover inserts **110** are provided with rib sections **112** that respectively engage mating recesses **114** and **96** in the side walls of the joint cover and end cover **86** for attachment in a snap lock fashion.

The spacer **68** is positioned at selected locations in a horizontal position along the full length of the panel section joint **16** to provide proper spacing between the retainer members **22** and to insure a proper snap lock engagement between the coupling member **50** and the retainer member **22.** The spacer **68** is disposed along the length of the panel section joint **16** at locations which are adjacent a selected number of the tabs **67** carried by the retainer coupling member **50,** such that these tabs **67** may be bent outwardly toward the spacer **68** to extend through the aperture **77** and wrapped around the adjacent portion of each spacer **68.** This arrangement secures the spacer **68** to the retainer coupling member **50,** all of which adds to the rigidity of stiffness and stability of the panel system **10** to prevent the same from undesired movement or misalignment.

At the panel section joints **16** other than an end joint, the end cover **86** is replaced by a retainer coupling member **50** which in turn carries the panel coupling member **46** and panel sections **12,** as aforementioned.

As herebefore indicated, the opposing pairs of spaced parallel wall sections **12** are maintained at a predetermined spaced distance by a support assembly **21** and, in addition, the support assembly **21** provides rigidity and stiffness to the wall panel sections **12.** Each support assembly **21** comprises a pair of vertically disposed T-shaped members **120** (FIG. **5**) which have a base **122,** the outer face of which abuttingly engages the inner surface of its associated wall panel sections **12.** Since the T-shaped members **120** are identical, it is to be understood that the description of one is equally applicable to the other and that like components will be identified with common numerals. The base **122** has rounded edges which extend back towards the mid-section of the base **122** and downwardly and outwardly to form a pair of opposing legs **124** and **126.** The legs **124** and **126** near the mid-section of the base **122,** define a longitudinally extending slot **128** of a width that is equal to the approximate thickness of the body section **69** of the aforementioned spacer **68.** The lower portion of the legs **124** and **126** are deformed to provide shoulders **130** which as will be described hereinafter cooperate with the spacers **68** to form a snap lock engagement. As can best be seen in FIG. **5,** the spacer **68** is positioned such that the outer parallel edges **70** thereof are inserted through the slots **128** and the edges of the spacer **68** abut the inner side of the base **122** of each of the T-shaped members **120,** while the tabs **79** on the spacer **68** snap lockingly engage one of the shoulders **130** formed on each of the T-shaped member legs **124** and **126.** Dual shoulders **130** are formed on the legs **124** and **126** of the T-shaped member **120** for ease of use, such that the worker who is assemblying the wall simply has to insert the spacer **68** between the legs **124** and **126** without concern for which side the tab **79** are disposed on the spacer **68** since the spacer **68,** when reversed will engage the shoulder **130** on either leg **126** in a snap lock fashion. The spacer **68** and the T-shaped member **120** are so designed that when they are inserted between the spaced wall sections **12** there is enough of a compressive fit therein between that the assembly **21** will remain in position without any additional fastening elements between T-shaped member and the interior surface of the wall panel sections **12.** As shown in phantom lines in FIG. **1,** a sufficient number of the spacers **68** are provided along the full length of the assembly **21** to securely attach the T-shaped members **120** to each other and to prevent the same from moving inwardly when pressure is exerted on the outside of the wall section **12,** thereby insuring the integrity, stability and appearance of the wall sections **12.** It should be noted that the panel spacer **68** is disposed in a vertical position when utilized in conjunction with the T-shaped members **120** to form the aperture **77** of spacer **68,** when employed within the wall joints **16,** facilitate the passage of wiring and conduits vertically through the joint **16,** while the aperture **77** of the spacer **68** when employed in the wall support assemblies **21,** facilitate the horizontal passages of such wiring and conduit through the wall panel sections **12.** The wiring and conduits passing through the spacer apertures **77** in the wall support assemblies **21** are also supported by the spacers **68,** or support assembly **21.** The face of each base in abutment with the inside surface of the wall panel sections **12** may be roughened for purposes of attaching the T-shaped members **120** to the wall sections **12.** The T-shaped members **120** may be attached to the wall **12** by any suitable adhesive or the faces of the bases may have small punch out tabs for engagement with the walls **12.**

It can thus be seen that the present invention has provided an extremely simple spacer adapted to perform numerous functions in a building wall panel system and which cooperates with various components of the system to provide snap lock means for fastening to these various components together at a proper distance, as well as for providing a simple means for the passage and support of the wiring and conduits passing through the wall.

Although only two forms of the present invention have been disclosed, it should be apparent to those skilled in the art of wall panel systems that other forms may be had, all coming within the spirit of the invention and scope of the appended claims.

What is claimed is as follows:

**1.** In a wall panel system comprising a plurality of wall panel sections connected in an end to end fashion by panel joints, a spacer member disposed within said panel system to maintain selected opposing components of said system in a predetermined spaced relationship, said spacer member comprising a body section having opposing parallel edges, two pairs of opposed spaced arms extending outwardly from said body portion in said direction as said parallel edges; the outer edge of each of said arms being provided with a rib adapted to engage components of said panel system in a snap lock fashion, each of said ribs being inwardly spaced from said body portion parallel edges; each of said pairs of extended arms defining thereinbetween a recess and the inner opposing surfaces of each of said pair of said arms having a groove formed therein for engaging in a snap lock fashion with a component of said wall panel system; the body section being provided with a central aperture of sufficient size to facilitate the passage of wiring and conduits therethrough; the side walls

of said aperture adjacent said body portion being bent outwardly in the same direction to define tab means, said tab means being inwardly spaced from said parallel edges and being disposed along an axis paralleling the edges of said body portion.

**2.** The wall panel defined in claim **1** wherein said spacer means is disposed in said panel joint between spaced parallel vertical members, said edges of said body portions being in abutting contact with said spaced members to define the predetermined spacing therein between, said spacer being disposed in a horizontal plane.

**3.** The wall panel system defined in claim **1** further comprising longitudinally disposed T-shaped members disposed between said panel sections and, respectively, abutting the opposing inner surfaces of said panel sections, the legs of said T-shaped members having openings therein which define snap lock means for the reception of said spacer; said spacer being disposed in a vertical position with said parallel edges respectively being received in said T-shaped leg openings with said tab means carried by said body portion of said spacer engaging said legs in a snap lock fashion to maintain said panel sections at a predetermined spaced apart distance.

**4.** The wall panel system defined in claim **1**, wherein said spacer means is disposed in said panel joints between spaced parallel members, said edges of said body portions being in abutting contact with said spaced members to define the predetermined spacing thereinbetween, said spacer being disposed in a plane which is perpendicular to the planes that said parallel members are disposed in.

**5.** The wall panel system defined in claim **3** further comprising means disposed between said T-shaped members in the abutting surfaces of said panel sections for securing said T-shaped members to said panel sections.

* * * * *