United States Patent

[11] 3,590,543

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[45] Patented **July 6, 1971**
Continuation-in-part of application Ser. No. 597,509, Nov. 29, 1966, now abandoned.

[54] **CLIP ASSEMBLIES FOR USE WITH CANOPIES AND WALL PANELING CONSTRUCTIONS**
8 Claims, 19 Drawing Figs.

[52] U.S. Cl. **52/478,** 52/489, 52/520, 52/529, 52/544
[51] Int. Cl. **E04d 3/362**
[50] Field of Search ..... 52/544, 478, 520, 522, 588, 529, 489; 287/189.36 C

[56] **References Cited**

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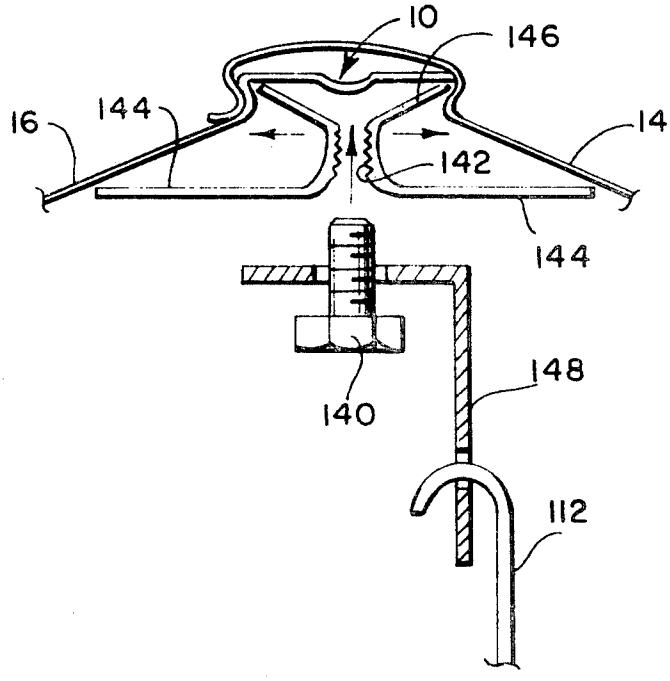
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Primary Examiner—Alfred C. Perham
Attorney—James D. Halsey, Jr.

ABSTRACT: Clip assemblies of varying configuration enabling decorative and functional fixtures to be attached to the interlocking flanges of adjacent panel elements characterized by varying techniques for permitting the clip assemblies to press outwardly against the locking flanges thus securing the clip assemblies within the locking flanges while resisting any tendency to slide or otherwise become unfastened.



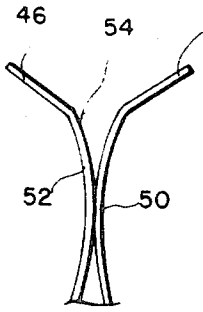


FIG. 2

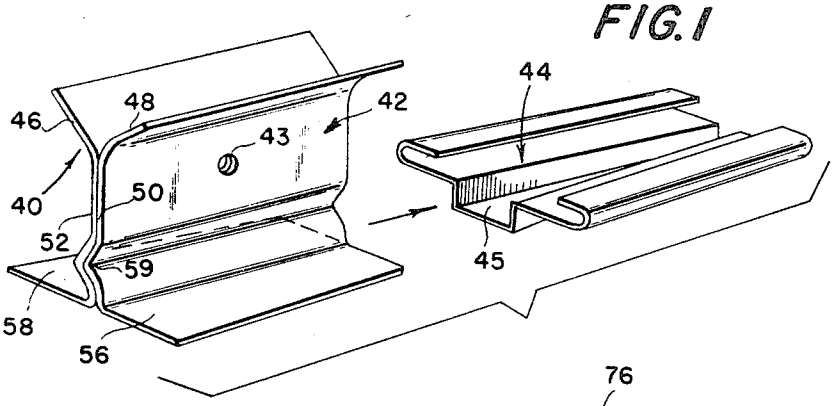


FIG. 1

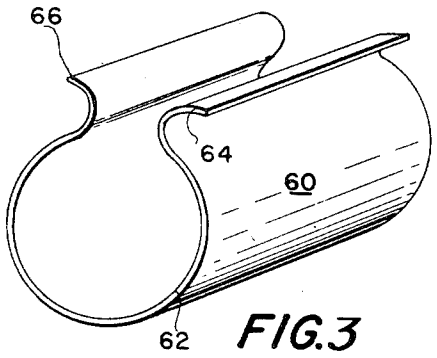


FIG. 3

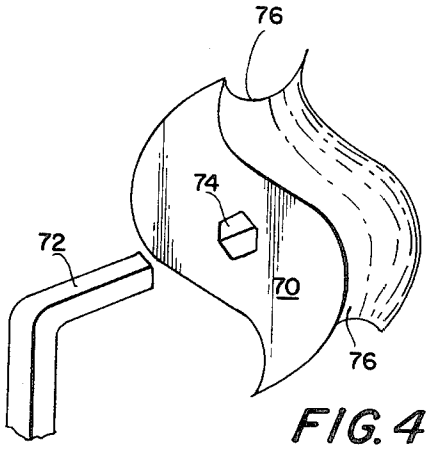


FIG. 4

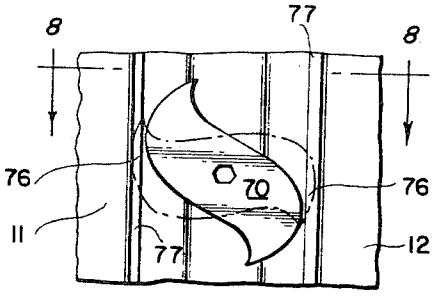


FIG. 5

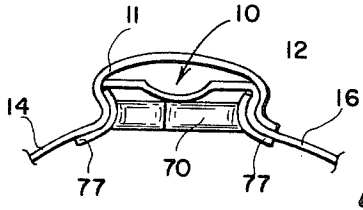


FIG. 6

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FIG.7

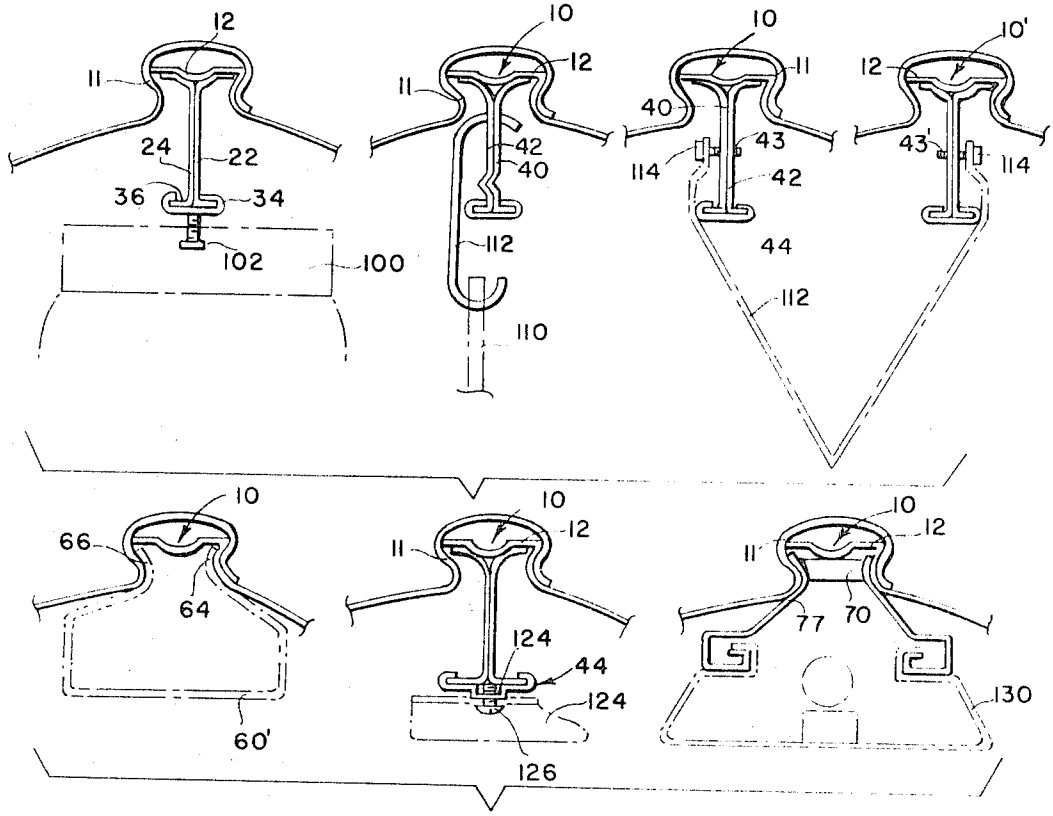


FIG.8

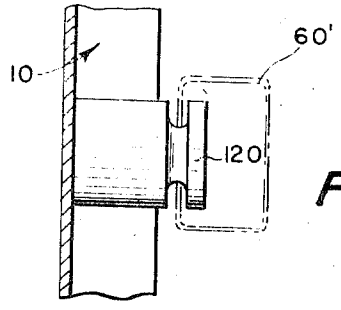


FIG.9

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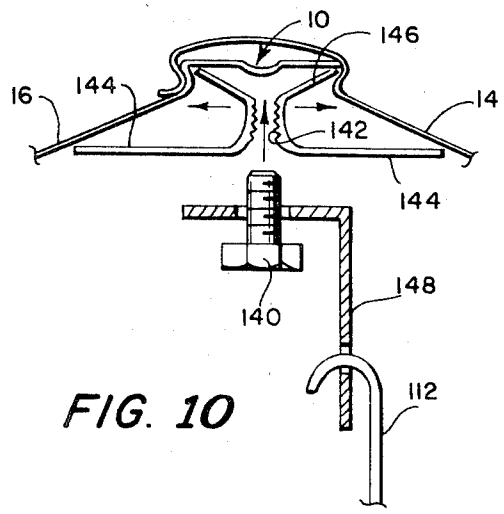


FIG. 10

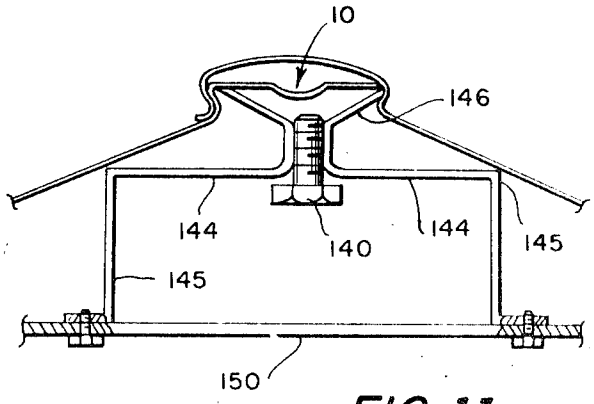


FIG. 11

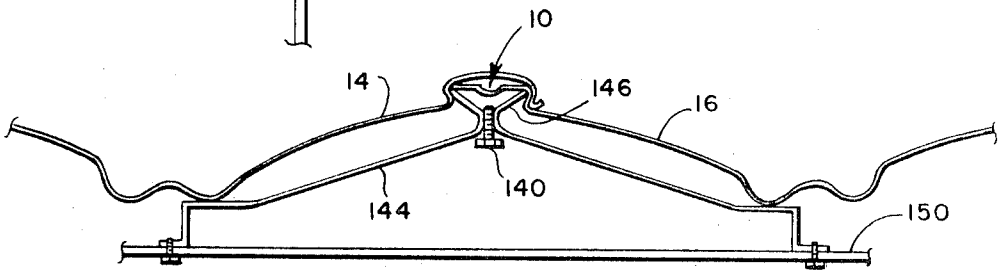


FIG. 12

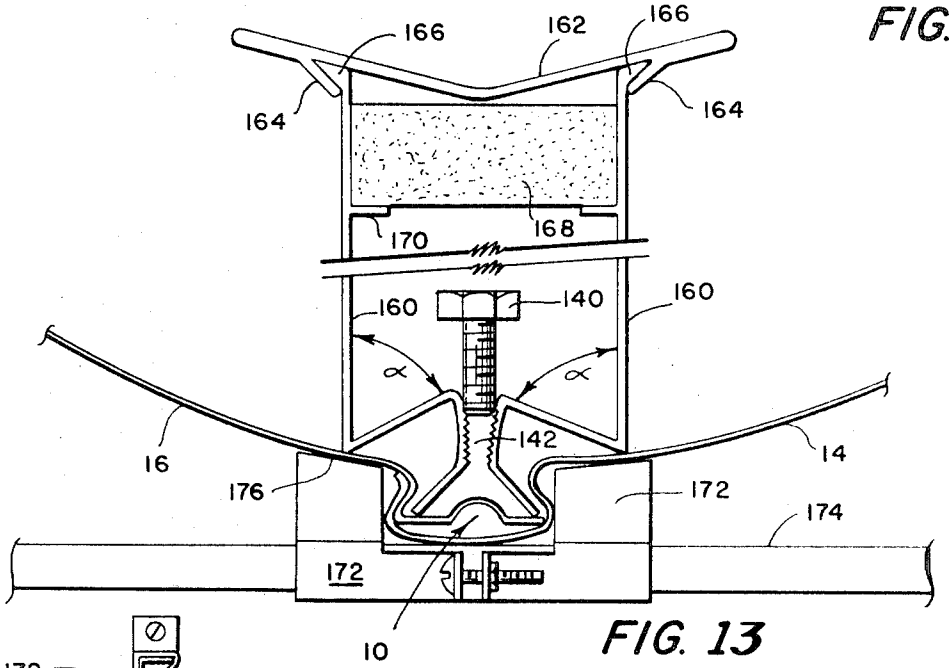


FIG. 13

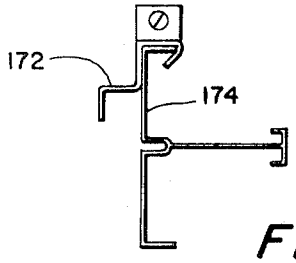


FIG. 14

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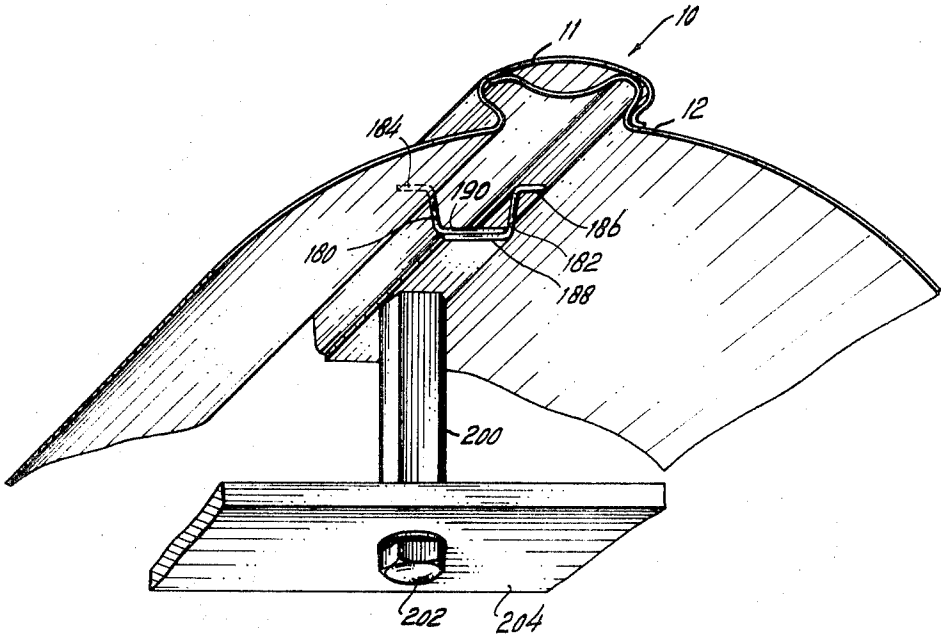


FIG. 15

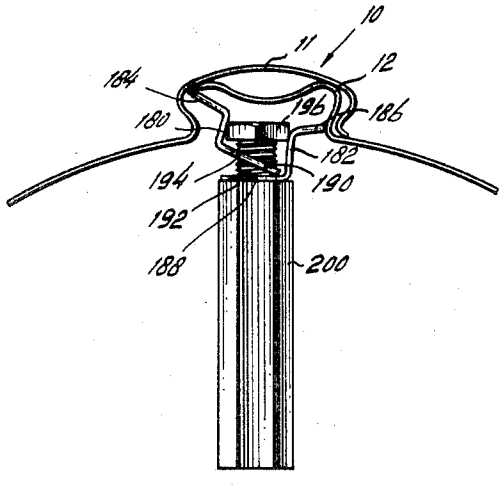


FIG. 16

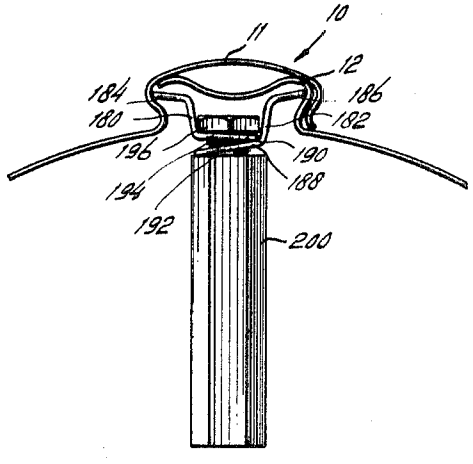


FIG. 17

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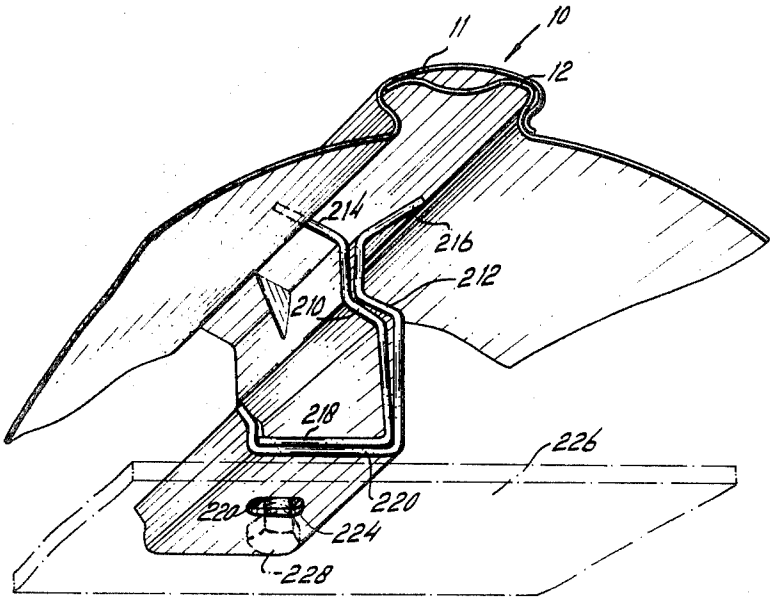


FIG. 18

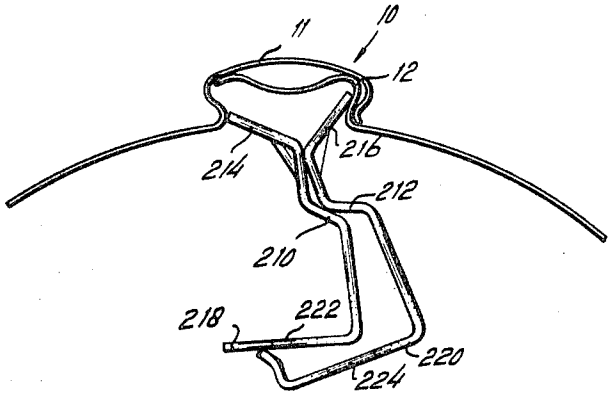


FIG. 19

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CLIP ASSEMBLIES FOR USE WITH CANOPIES AND WALL PANELING CONSTRUCTIONS

The present application is a continuation-in-part of application Ser. No. 597,509, filed Nov. 29, 1966, and now abandoned entitled "Clip Assemblies For Canopy And Wall Paneling Construction."

BACKGROUND OF THE INVENTION

The present invention relates generally to canopy and wall paneling systems and in particular to clip assemblies of varying design enabling structure such as ceilings, light fixtures, signs and decorative panels to be attached thereto.

With the widespread use of canopy and wall paneling systems, employing interlocking light gauge metal panel elements, the need has arisen to provide fasteners for attaching decorative and functional fixtures thereto. To provide necessary versatility such fasteners must permit the removal and rearrangement of fixtures without harm or defacement of panel elements. Of course, such fasteners must not be permanent in the sense that punching or drilling holes through the panels is required. Finally, minimizing installation time is of the utmost importance.

SUMMARY OF THE INVENTION

Although the configuration of the fasteners or clip assemblies may vary, as set forth in detail hereinafter, it is essential to the present invention that each assembly include two legs which are designed to fit within and press outwardly against the sides of adjacent panels which form the interlocking area. When sufficient outward pressure against the sides of panel interlocking area is achieved, the clip assembly resists being pulled apart from the panel interlock, this being particularly important in the case of vertical panels in which the clip must resist downward movement along the panel interlock.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a first embodiment of the present invention, comprising a three-piece, rolling action clip assembly;

FIG. 2 is a sectional view illustrating the curvilinear intermediate walls of the first embodiment clip assembly;

FIG. 3 is a second embodiment of the present invention, comprising a one-piece, spring action clip assembly;

FIG. 4 is a perspective view of a third embodiment of the present invention, comprising a three-piece cam action clip assembly;

FIG. 5 is a top view of the third embodiment cam action clip assembly illustrating its locking position within interlocking flanges;

FIG. 6 is a side view illustrating the third embodiment cam action clip assembly inserted in locking position within the terminal sides of adjacent panel elements constituting the interlocking area; FIG. 7 is a side view of horizontal wall formed of interlocking panel elements illustrating schematically the suspension of a light fixture, swinging and nonswinging signs;

FIG. 8 is a top view of vertical wall formed of interlocking panel elements illustrating schematically the attachment of decorative strips, sign letters and light strips;

FIG. 9 is a cross section illustrating a lock clip for securing horizontal decorative strips to vertical wall paneling;

FIG. 10 is a sectional view of a fourth embodiment of the present invention, comprising a three-piece clip assembly characterized by wedge action resulting from screwing action;

FIG. 11 is a sectional view of the fourth embodiment clip assembly illustrating the ends of clip components being extended as mounting flanges;

FIG. 12 is a sectional view of the fourth embodiment clip assembly illustrating the ends of clip components extended outwardly to bear on adjacent panel troughs to achieve lateral stability;

FIG. 13 is a sectional view of the fourth embodiment clip assembly illustrating adaptation of principles to a vertical divider for attachment to panel lock; and

FIG. 14 is a sectional view of backup clip used in conjunction with the fourth embodiment clip assembly for providing additional lateral stability.

FIG. 15 is a perspective view of the fifth embodiment of the present invention, comprising two clip component arms designed to be forced outwardly into contact with the interlocking flanges of adjacent panels by the action of threading a hexagonal rod on bolt;

FIG. 16 is an end view of the fifth embodiment illustrating the position of rod on bolt before the clip component arms begin to spread;

FIG. 17 is an end view of the fifth embodiment illustrating the position of rod on bolt as the clip component arms begin to spread outwardly into contact with locking flanges;

FIG. 18 is a perspective view of the sixth embodiment of the present invention, comprising a two piece clip assembly snapped into locking position; and

FIG. 19 is an end view of the sixth embodiment of the present invention illustrating the position of the clip components before being snapped into locking position.

The first embodiment three-piece, rolling action clip assembly is illustrated in FIGS. 1—2. In this embodiment, the clip components are designated by reference numerals 40, 42 and 44. Components 40 and 42 terminate upwardly in diverging arms 46 and 48 which are designed to be inserted within panel interlock 10 (FIG. 15). The rolling action of the first embodiment clip assembly is achieved by the middle segments 50 and 52, which are rolled outwardly (FIG. 2) thus defining space 54 therebetween. In this manner, as lower flanges 56 and 58 are pressed inwardly by overlying component 44, upper flanges 46 and 48 are forced outwardly into locking relationship within panel interlock 10. Members 50 and 52 include a zigzag portion generally represented by the reference numeral 59, this offset preventing side-to-side movement. Finally the offset portion 45 of slide-on component 44 provides clearance for a fastener, such as nut, used to attach desired fixture to the second embodiment clip assembly. Of course, the ends of arms 46, 48 and flanges, 56 and 58 may be serrated to increase gripping action, if desired.

The second embodiment spring action clip assembly is illustrated in FIG. 3. This clip assembly 60 includes a generally C-spring section 62 which is compressed by hand to permit legs 64 and 66 to enter panel interlock 10 (FIG. 15). When released, arms 64 and 66 spring outwardly against the side flanges 11 and 12 of panel interlock 10. Of course, the strength or holding power of clip assembly 60 varies considerably with the strength (gauge) of metal and overall cross-sectional dimension. As illustrated in FIG. 14, clip assembly 60 may be formed as a complete fixture as explained in detail hereinafter.

The third embodiment cam action clip assembly is illustrated in FIGS. 4—6. The cam-shaped insert 70 is installed with hexagonal key 72 which is inserted within hexagonal slot 74 of insert 70. Alternatively, insert 70 can be installed with a wrench or screwdriver. As will now be apparent as insert 70 is twisted to locking position (FIG. 5—dotted lines), edges 76 of insert 70 force clip arms 77 into contact with the terminal sides 11 and 12 of panel interlock 10.

In the fourth embodiment of invention, as illustrated in FIGS. 10—13, the locking action is caused by the insertion of bolt 140 into the slot 142 formed between clip halves 144. At slot 142, the clip halves 144 are tapered so that the insertion of bolt 140 will spread them apart to achieve the necessary wedge action. The lateral or side-to-side stability of this clip design is improved since the arms of clip halves 144 bear directly on the face of adjoining panels 14 and 16 in addition to the flanges 146 being caused to wedge outwardly against the sides of panel lock 10. A C-support 112 attached to angle 148 may be employed to support a swinging sign, for example.

FIG. 11 illustrates the outer arms of clip halves 144 being formed as mounting flanges 145 for supporting items such as sign letters 150.

FIG. 12 illustrates the still further extension of the arms of clip halves 144 so as to bear further outwardly along the panels, particularly against the troughlike bottoms 152 of panels 14 and 16, thus providing the maximum amount of lateral stability.

FIG. 13 illustrates a vertical divider or accent strip for use with vertically disposed panels 14 and 16 in which the clip components number three and include right and left hand components 160 of identical configuration. The third component is in the form of a decorative cap 162 having locking flanges 164 that mate with flanges 166 of sides 160. By properly sizing angle alpha, cap member 162 is held in place by the outward friction between the interlocking flanges 164 of cap 162 and flanges 166 of sides 160. That is, by properly sizing the angle alpha, sides 160 are flared outwardly in relationship to one another as bolt 140 is wedged within tapered slot area 142 and flanges 166 are forced outwardly into locking relationship within flanges 164. Cap 162 is installed after the sides 160 are inserted into panel lock 10 by springing sides 160 together and then releasing.

However, to ensure that there is sufficient spring action, a flat elliptical metal spring member or oversized sponge plastic strip 168 is positioned within flanges 170 to increase the outward pressure against flanges 164 of cap 162.

To further stiffen the assembly against lateral movement, a backup clip 172 (FIG. 14) may be used to form a rigid base against which sides 160 can bear when expanded by the insertion of bolt 140. Clips 172 slip over the top flange of T-furring members 174 and straddle panel lock 10 as seen in FIG. 13. Backup clips 172 are slipped into place when needed as panels 14 and 16 are installed to the T-furring members 174. Note that the flanges 176 which touch the backside of panels 14 and 16 are tapered. Thus, by tightening bolt and nut assembly 178 a wedging action is created outwardly against the sides of clip components 160, thus further ensuring tight fit.

The fifth embodiment clip assembly is illustrated in FIGS. 15—17 wherein clip components 180 and 182 terminate at one end in flanges 184 and 186, respectively, and at the other end in abutting end portions 188 and 190 having a hole 192 and slot 194, respectively, thru which bolt 196 passes into an internally threaded portion (not shown) of hexagonal rod 200. Finally, bolt 202 is threaded within the opposite end of rod 100 to support fixture 204.

As will be apparent, after clip components 180 and 182 are inserted within interlock 10 and bolt 196 passed thru hole 192 and slot 194 into rod 200, a wrench (not illustrated) is used to turn rod 100 upwardly on bolt 196. As flanges 184 and 186 are initially forced—by the action of screwing rod 200 on bolt 196—against the inner surfaces of panel flanges 11 and 12 (FIG. 16), end portions 188 and 190 come into contact with each other and begin to align themselves with each other. As rod 100 is screwed still further upward (FIG. 17), end portions 188 and 190 are forced still further into alignment and flanges 184 and 186 forced outwardly to grip the inner surfaces of panel interlocking flanges 11 and 12.

The sixth embodiment clip assembly is illustrated in FIGS. 18—19 wherein the clip components 210 and 212 terminate at one end in flanges 214 and 216, respectively, and at the other end in mating L-shaped locking members 218 and 220. As inner member 218 is locked within outer member 220, flanges 214 and 216 are forced outwardly against the inner surfaces of panel locking flanges 11 and 12 securing the entire clip assembly thereto. Locking members 218 and 220 are provided with hole 222 and slot 224, in similar manner to hole 192 and slot 194 of the eighth embodiment, permitting fixture 226 to be attached to the clip assembly with bolt assembly 228.

Various applications of the clip assemblies of the present invention are illustrated generally in FIGS. 7 and 8. In FIG. 7, the reference numeral 100 schematically designates a light fixture which is suspended from horizontally disposed panel elements 11 and 12 with the use of the first embodiment clip assembly consisting of wedge components 22 and 24. Screw 102 is used to attach light fixture 100 to flanges 34 and 36 of the first embodiment clip assembly in conventional manner.

As also seen in FIG. 7, a swinging sign 110 is attached to adjacent horizontal panel elements 11 and 12 with the use of the second embodiment rolling action clip assembly. After the clip components 40 and 42 are assembled into locking relationship within panel interlock 10, C-support 112 is passed through opening 43 while swinging sign 110 is attached to the lower end of C-support 112.

As further seen n FIG. 7, a nonswinging sign 112 is suspended between adjacent panel interlocks 10 and 10' with the use of the second embodiment, rolling action clip assembly. In this instance, sign 112 is attached to the clip assemblies with the use of bolts 114 which pass through openings 43 and 43' within the clip assemblies.

In FIG. 8 is illustrated cross-sectional views of vertical wall paneling. A strip 60' of decorative paneling, which constitutes the third embodiment spring action clip assembly 60 formed as a single fixture, is attached within panel interlock 10 merely by compressing legs 64 and 66 inwardly within panel interlock 10 and releasing.

As horizontal strips 60' may be desired, lock clips 120 (FIG. 9) may be inserted within panel interlocks 10 and strips 60' snapped in place upon clips 120. Of course clips 120 may be attached to panel interlocks 10 by most any of the aforementioned techniques.

Still further schematically illustrated in FIG. 8 is a typical sign letter 122 suspended from panel interlock 10 of vertical elements 11 and 12. In this instance, sign letter 122 is attached to overlying component 44 of a version of the second embodiment clip assembly with nut 124 and bolt 126.

Finally, a light strip 130 is illustrated in FIG. 8 as attached to panel interlock 10 of vertical elements 11 and 12 with the fourth embodiment cam action clip assembly.

Manifestly, variation in clip configuration and other use thereof may be envisioned without departing from the spirit and scope of invention as defined in the subjoined claims.

I claim:

1. A paneling assembly, comprising:

A. a plurality of flexible panel elements having side portions adjacent each other, said adjacent side portions of adjacent panels defining first and second locking flanges permitting said panels to be assembled as a wall, said first locking flange of one of said adjacent side portions overlying said second locking flange of the other of said adjacent side portions, said first locking flange having inwardly converging side portions defining an opening while said second locking flange has an inwardly converging side portion complimentary in configuration to and abutting the closest of said inwardly converging side portions of said first locking flange, said second locking flange terminating in an end portion exceeding the expanse of said opening for engagement within and between said inwardly converging side portions of said first locking flange, said inwardly converging side portion of said second locking flange and the inwardly converging side portion of said first locking flange oppositely disposed constituting supporting surfaces, said locking flanges preventing said panels from unlocking by reverse action;

B. a clip assembly secured to said locking flanges, said clip assembly including arms abutting said supporting surfaces of said first and second locking flanges, said clip assembly further including means regulatively forcing said arms outwardly against said supporting surfaces of said locking flanges;

C. a fixture; and

D. means securing said fixture to said clip assembly.

2. A paneling assembly as in claim 1, including means withdrawing said arms inwardly from said supporting surfaces permitting said clip assembly to be relocated, as desired.

3. A paneling assembly as in claim 1, said means regulatively forcing said arms outwardly against said inner supporting surfaces of said locking flanges forming an integral part of said clip assembly, one of said flanges terminating in a generally U-shaped portion within which the other of said flanges is snapped in place resulting in said arms being pressed outwardly.

4. A paneling assembly as in claim 1, wherein said means for regulatively forcing said arms against said supporting surfaces includes an element for compressing first portions of said arms in one direction so as to move those portions of said arms in contact with said supporting surfaces in the opposite direction by rolling action.

5. A paneling assembly as in claim 1, wherein said means for regulatively forcing said arms against said supporting surfaces includes a resilient intermediate portion connecting said arms capable of being compressed after which said arms are released outwardly by spring action.

6. A paneling assembly as in claim 1, wherein said means for regulatively forcing said arms against said supporting surfaces includes a cam element located between said arms.

7. A paneling assembly as in claim 1, wherein said means for regulatively forcing said arms moves said arms outwardly.

8. A paneling assembly as in claim 1, wherein said means for regulatively forcing said arms against said supporting surfaces includes a bolt for wedging insertion between selected portions of said arms, said portions being tapered.