May 17, 1966 J. C. WARING ETAL 3,251,168

EXTERIOR WALL COVERING AND SUPPORT THEREFOR

Filed Dec. 28, 1961 3 Sheets-Sheet 1

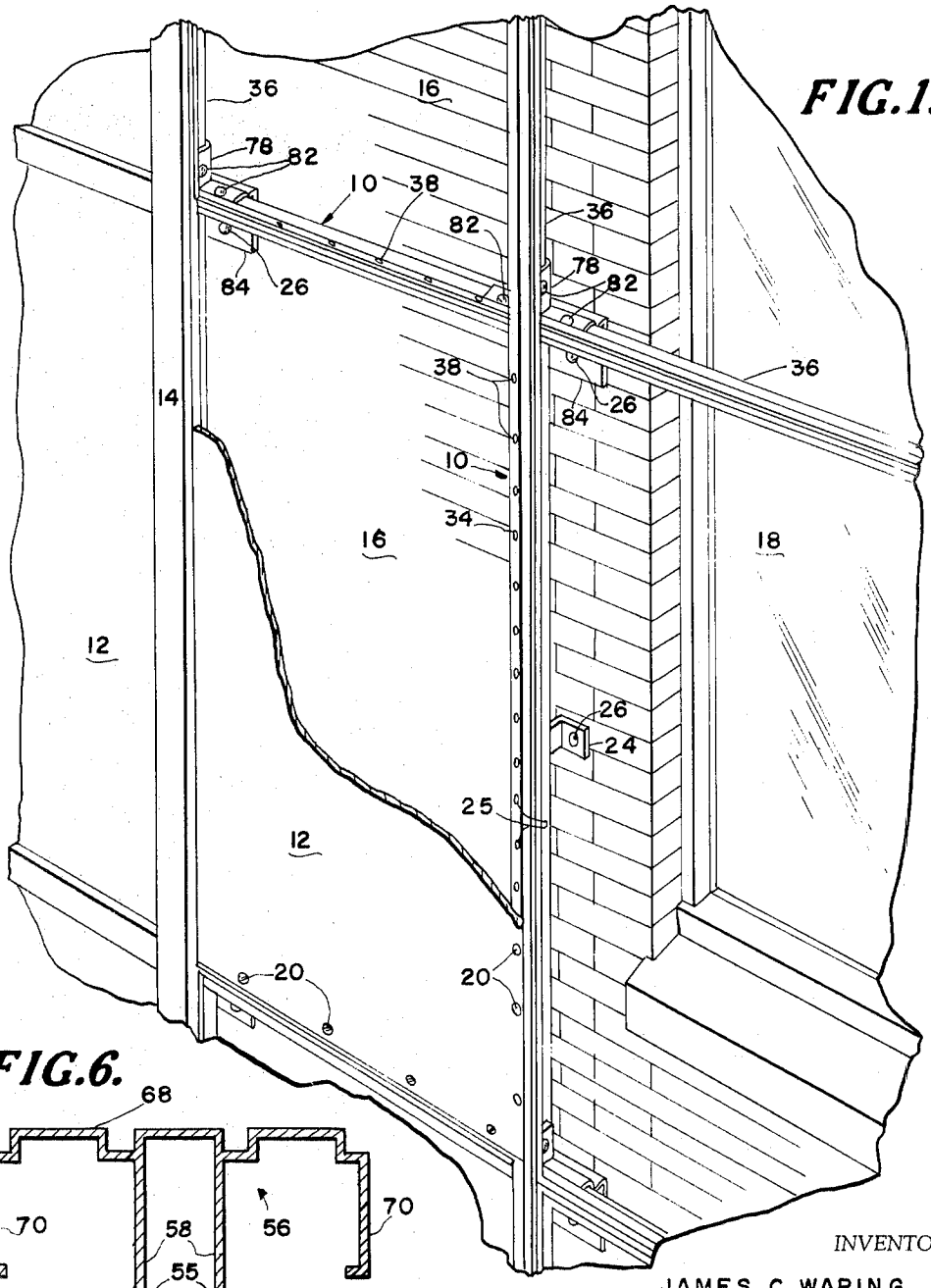

FIG.1.

FIG.6.

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Filed Dec. 28, 1961 3 Sheets-Sheet 2

FIG. 5.

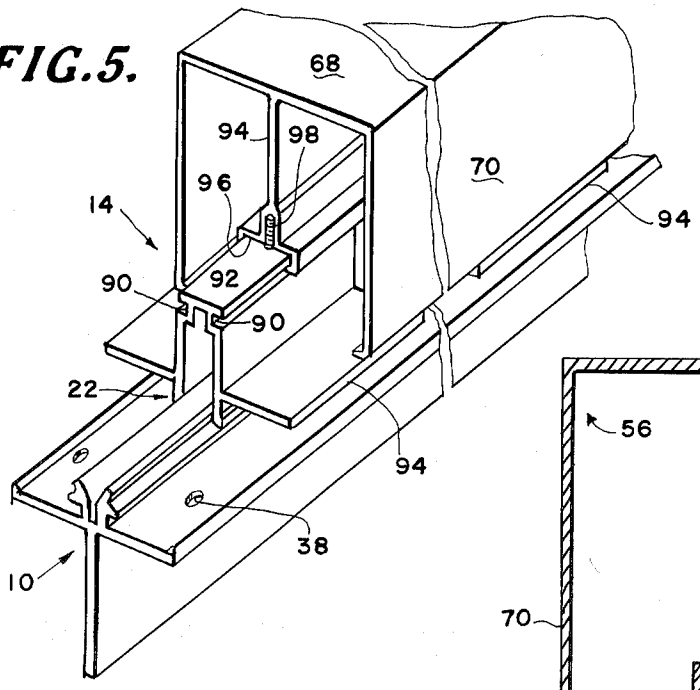


FIG. 4.

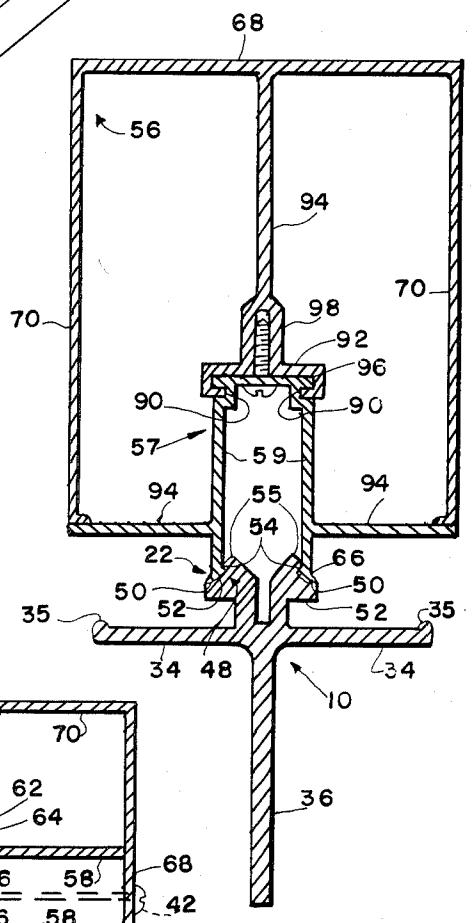
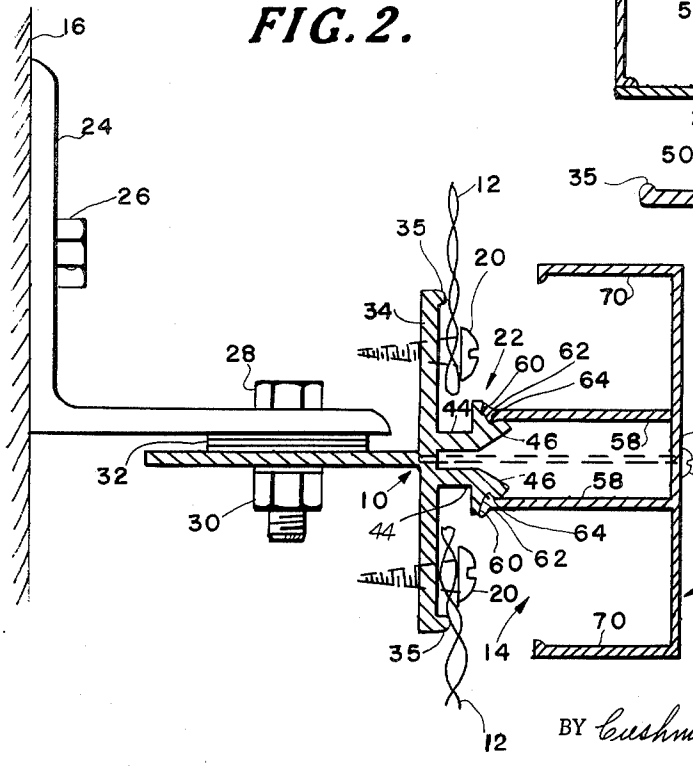


FIG. 2.



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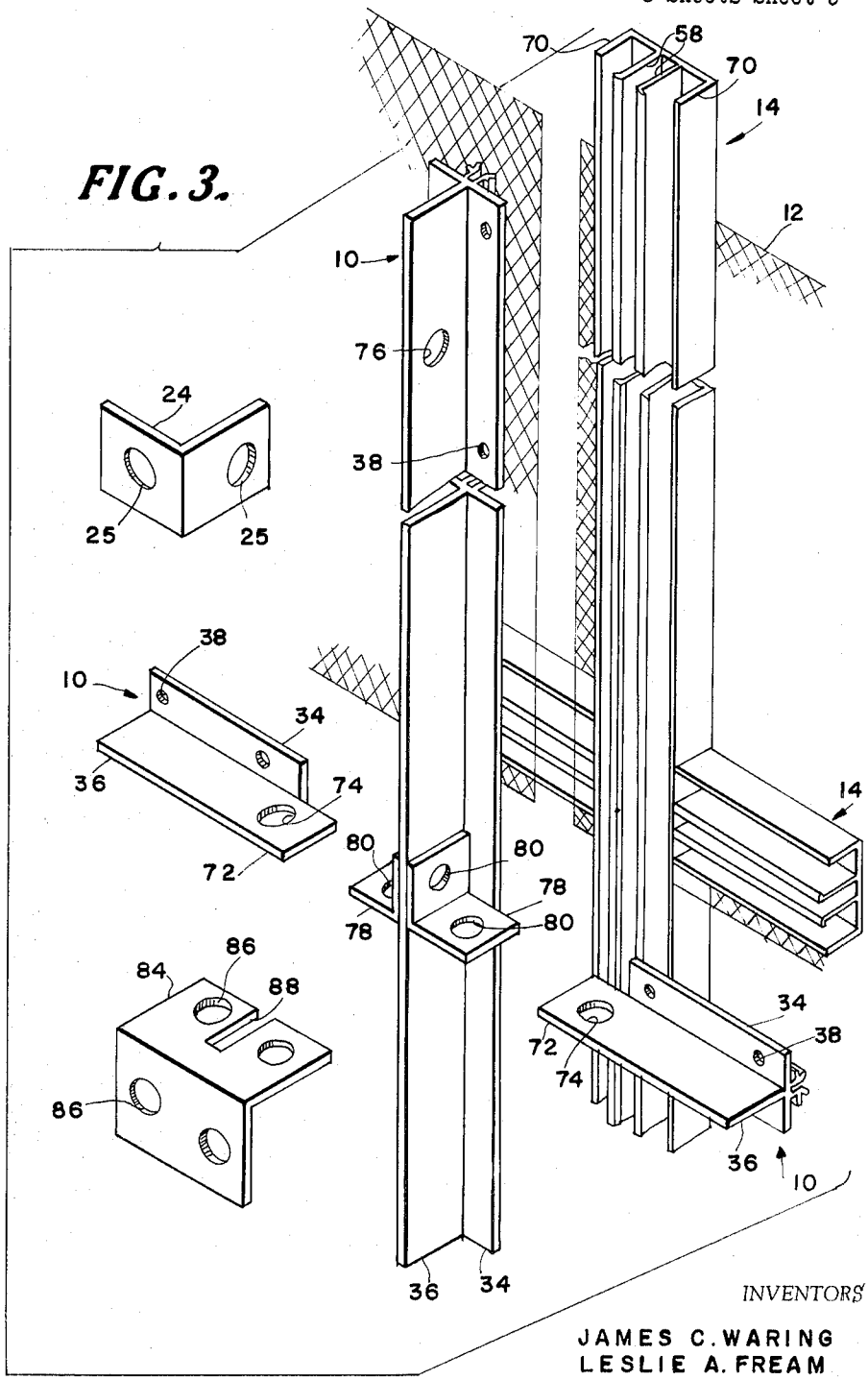
Filed Dec. 28, 1961 3 Sheets-Sheet 3

FIG. 3.



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EXTERIOR WALL COVERING AND SUPPORT THEREFOR

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13 Claims. (Cl. 52—460)

This invention relates to rigid wall coverings for existing walls of a building. More in particular, it relates to a combination of furring strips, preferably of extruded metal, which can be attached to the exterior of the existing walls of a building, panels which are attached to adjacent strips and mullion covers which can be frictionally coupled with the strips in order to cover the strips and the edges of adjacent panels. The assembly of metal furring strips, panels and mullion covers provides a continuous covering which is particularly adapted to the remodeling of the unsightly exteriors of old buildings.

Wall coverings which comprise elongated extruded metal furring strips, frictionally coupled covers therefor and panel members between adjacent strips are known in the prior art. A known construction, for example, provides an elongated extruded snap-on cover which is generally H-shaped in transverse cross-section and which has a prong projecting outwardly from one of the legs of the H. The furring strip has a complementary prong-receiving groove or slot into which the prong on the cover can be pressed and which then frictionally holds the prong in place. The two slots formed by the spaces between the legs of the H loosely engage an edge of a wall panel which is thus supported along its upper and lower edges by two horizontal covers and along its side edges by two vertical covers. This type of assembly suffers from the disadvantage that the panels, not being rigidly attached to the furring strips are subject to vibration and distortion by, for example, the action of the wind. In addition, in this type of assembly the weight of the panels is transmitted to the furring strips through the friction couplings which could pull apart under the action of the wind. In addition, in this type of assembly the panels must be sufficiently rigid and have sufficient strength to resist distortion from their own weight when placed in a vertical position with their edges loosely resting in the slots of the covers.

The system of the present invention differs from the known construction just described in that the panels are rigidly supported along their edges. This arrangement is particularly advantageous when metal mesh panels or other weak or flexible panels which are not self-supporting are employed. In addition the weight of the panels is borne directly by the furring strips. In addition, in the present invention the mullion covers may be readily removed and replaced with others of different size and shape without disturbing the panles and furring strips in order to produce a variety of appearances to the wall covering. These advantages are obtained by providing a furring strip, preferably of extruded metal, which is adapted to have the edges of adjacent panels rigidly secured thereto and a mullion cover which is adapted to be frictionally coupled to the furring strip after the panels have been secured.

It is therefore a primary object of the invention to provide an arrangement of extruded metal furring strips and frictionally coupled covers therefor which permits panels to be rigidly supported along their edges.

It is a further object of the invention to provide an arrangement of extruded metal furring strips, and frictionally coupled covers therefor which permits panels to be secured directly to the furring strips.

It is a further object of this invention to provide a wall covering which comprises extruded metal furring strips, frictionally coupled covers therefor and panels which are strong and rigid.

It is a further object of this invention to provide an arrangement of extruded metal furring strips, frictionally coupled covers therefor and panels which permit the covers to be removed without disturbing the panels or furring strips.

It is a further object of the invention to provide an arrangement of extruded metal furring strips and frictionally coupled covers therefor which is particularly suited to the support of panels constructed of expanded metal mesh or other weak or flexible metal.

These and other objects and advantages will become apparent to those skilled in the art upon reading the following detailed description of the invention taken in conjunction with the drawings in which:

FIGURE 1 is a perspective assembly view, partly cut away and partly schematic, of a wall covering constructed in accordance with the invention showing generally how the furring strips, panels and mullion covers are applied to the exterior of a wall of an existing building;

FIGURE 2 is a transverse section through a furring strip, mullion cover showing the manner in which the strip is mounted on an existing wall.

FIGURE 3 is an exploded view of a junction between horizontal and vertical furring strips and mullion covers.

FIGURE 4 is a transverse section through a furring strip and a modified mullion cover.

FIGURE 5 is a perspective view of the furring strip and mullion cover of FIGURE 4.

FIGURE 6 is a transverse section through a mullion cover and a modified furring strip.

Referring now to the drawings there is shown a wall covering which is assembled from a plurality of extruded aluminum furring strips 10, aluminum mesh panels 12 and extruded aluminum mullion covers 14. As seen in FIGURE 1, the furring strips 10 are attached to the exterior of an existing wall 16 of a building in spaced horizontal and vertical positions so as to form a support grid parallel to and spaced from the wall 16 for the attachment of the panels 12 and mullion covers 14. The wall covering may extend over any openings in the existing wall such as a window 18 or it may leave such openings uncovered, depending on the desired appearance and purpose of the wall covering. Each space in the grid of furring strips 10 is occupied by one of the panels 12 each of which is fastened with screws 20 along its upper and lower edges to two spaced horizontal furring strips 10 and along its side edges to two spaced vertical furring strips 10. Each portion of a furring strip 10 which defines a side, top or bottom of a grid space thus is fastened to and helps to support two adjacent panels which are slightly spaced from each other. Projecting through the space between each two adjacent panels is one-half of a friction coupling, or snap-lock 22, which is integral with the furring strip 10 to which the two adjacent panels 12 are attached. A mullion cover 14 having the complementary mating half of the friction coupling, or snap-lock 22, projecting therefrom is firmly held by the projection on each furring strip.

The relative positions of the existing building wall 16, a furring strip 10, panels 12, and a mullion cover 14 and the manner in which they are interconnected is shown in FIGURE 2. An L-shaped angle clip 24 has one leg secured in a vertical position to the existing wall 16 with a galvanized steel bolt 28 which passes through a hole 25 in the leg of the clip. The other leg of the clip extends horizontally from the wall 16. A bolt 28 passes vertically through the horizontal leg of clip 24 and portion 36 of a furring strip 10 and is provided with a

nut 30. One or more spacing washers 32 are placed as needed between the horizontal leg of the angle clip 24 and the portion 36 of furring strip 10 to aid in positioning the furring strip 10. Portion 34 of the furring strip 10 provides a flat surface parallel to wall 16 to which the edges of panels 12 are fastened with self-tapping screws 20. Portion 34 is provided with a plurality of horizontally spaced holes 38 so that self-tapping screws 20, which can be readily forced through the expanded aluminum of which the panels 12 are constructed, may be easily screwed into place. The use of expanded aluminum mesh panels 12 and self-tapping screws 20 is advantageous because no preformed holes need be formed through the edges of the panels and therefore no alignment of holes in panels and portion 36 of the furring strips 10 is necessary. After the panels 12 are installed in the grid spaces formed by horizontal and vertical furring strips 10, a mullion cover 14 is pressed into position on each furring strip 10 and held there by engagement of the snap lock 22. If desired spaced screws 42, shown in dotted lines in FIGURE 2, may be inserted through the mullion covers 14 into the furring strip to provide a more positive coupling between these two elements.

Each furring strip 10 of FIGURES 1–5 is an elongated extruded aluminum strip of uniform generally T-shaped cross-section throughout its length. A flattened portion forms the cross bar 34 of the T and a portion projecting at a right angle along the center line thereof forms the body 36 of the T. Each end of cross bar 34 is provided with a lip 35 extending in a plane parallel to that of body 36 and in a direction opposite to that of body 36. Two spaced parallel rib projections 44 extend at right angles from the side of the cross bar 34 which is opposite body 36 and define the retaining half of snap lock 22. The outer end 46 of each projection 44 is of enlarged cross-section and is provided along its lateral surface with a groove 48. The cross section of each groove 48 is formed by three flat surfaces; a first surface 50 extends substantially parallel to cross bar 34 from the lateral surface of end 46 toward the center of end 46; a second surface 52 joins the first surface 50 at an obtuse angle and extends in a direction away from the cross bar 34; a third surface 54 makes a right angle with the second surface 52 and extends back to the lateral surface of end 46. The lateral surface between this junction and the tip of end 46 forms a convex surface 55.

Each mullion cover 14 of FIGURES 1–3 and 6 is an elongated extruded aluminum strip of uniform cross-section consisting of a shell portion 56 and two spaced parallel legs 58 projecting therefrom which define the projecting half of snap-lock 22.

The free end 66 of each leg 58 is of enlarged cross-section and is provided with three flat surfaces 60, 62 and 64 which are complementary to the engageable with surfaces 50, 52 and 54 of the groove 48 in end 46 of projection 44. While the embodiments illustrated in the drawings show the projecting half of snap lock 22 on the mullion cover 14 and the receiving half on the furring strip, the location of the respective halves could be reversed, if desired. It should be understood also that the particular snap lock 22 illustrated is not critical and that other similarly acting snap locks could be employed. In FIGURES 2–6 the shell portion 56 of each mullion cover 14 is seen to consist of an outer body portion 68 which is parallel to cross bar 34 of the furring strip 10 and two parallel skirt portions 70 which extend from the outer portion 68 toward the furring strip 10. The cross-sectional shape of outer portion 68 and skirt portions may be varied as desired (for example FIGURES 2 and 6) to change the external appearance of the mullion cover 14. The size of outer portion 68 and skirt portions 70 may also be varied as desired so long as these elements are large enough to effectively hide from view the edges of adjacent panels 12 which are fastened to the furring strips 10.

FIGURE 3 shows the manner in which horizontal and vertical furring strips 10 and mullion covers 14 are secured to each other at a junction of horizontal and vertical pieces. The vertical furring strips 10 are continuous from top to bottom of the assembled wall covering and the horizontal furring strips 10, which are shorter in length, are connected at each end thereof a vertical furring strip 10 and indirectly to the end of an adjacent horizontal furring strip 10. In order to permit these connections to be made, the body 36 of each horizontal furring strip has a portion 72 which extends longitudinally at each end of the furring strip beyond cross bar 34 and which is provided with a bolt hole 74 transversely therethrough. Body 36 of vertical furring strips 10 is provided with spaced bolt holes 76 transversely therethrough. Connection between horizontal and vertical furring strips may be made by means of L-shaped angle clips 78 having a bolt hole 80 through each leg and bolts 82 (FIGURE 1). Two angle clips 78 are attached to opposite sides of body 36 of a vertical furring strip by aligning a hole 80 through each angle clip 78 with one of the holes 76 in body 36 and inserting a bolt 28 (FIGURE 2) therethrough. Holes 74 in the portions 72 of two adjacent horizontal furring strips are aligned with holes 80 in the other legs of angle clips 78 by positioning the upper surface of portion 72 in contact with the lower surfaces of the leg of the angle clips 78. The portion 72 of horizontal furring strip 10 is of such length that when holes 70 and 80 are in alignment, the ends of cross bar 34 of the horizontal furring strips abuts against the lateral surface of cross bar 34 on the vertical furring strip as seen in FIGURE 1. An L-shaped angle clip 84 having a pair of holes 86 transversely through each leg thereof and a longitudinal slot 88 between the holes 86 of one leg is employed to fasten the junction of horizontal and vertical furring strips 10 to wall 16. Slot 88 is of such length and width that body 36 of a vertical furring strip 10 will readily slide into it so that the end of the slotted leg will come into abutment with the cross bar 34. When angle clip 84 is in this position, holes 86 are in alignment with holes 74 in end portions 72 of the adjacent horizontal furring strips 10 and with the holes 80 in angle clips 78. Bolts such as 86 are then inserted through holes 80, 74 and 86 to complete the junction. Bolts 26 are then inserted through holes 86 in the non-slotted leg of angle clip 84 to hold the junction to wall 16. Intermediate the junctions the horizontal and vertical furring strips 10 are secured to wall 16 with L-shaped angle clips 24 as already described with respect to FIGURE 2.

A modified mullion cover 14 mounted on a standard furring strip 10 is illustrated in FIGURES 4 and 5. In this modification the shell portion 56 and leg portion 57 are separate pieces secured together. The leg portion 57 is an extruded aluminum strip of uniform generally U-shaped cross-section having spaced parallel legs 59 which are identical to legs 58 of the mullion cover 14 of FIGURES 1–3 and 6 except that each leg 59 is provided with a lateral wing piece 94 extending at a right angle from the side thereof. The exterior surface of each leg 59 near the base of the U is provided with a groove 90 with the result that the portion of the U which joins the legs 59 together forms a flange 92. The shell portion 56 of the modified mullion cover 14 is an extruded aluminum strip having outer portion 68 and parallel skirt portions 70 similar to elements 68 and 70 of the mullion cover 14 of FIGURES 1–3 and 6. Wing pieces 94 on leg portion 57 and skirt portions 70 on shell 56 are of such length that they abut one another along their adjacent edges. The outer portion 68 of the modified mullion cover 14 is provided with a center leg 94 projecting outwardly therefrom between the skirt portions 70. The free end of leg 94 is of enlarged cross-section and has a groove 96 therein which is complementary to and slidably engageable with flange 92 on leg portion 57. To hold the flange 92 and groove 96 tightly together, spaced screws 98 are inserted

through the flange 92 into the body of leg 94. The leg portion 57 of the modified mullion cover 14 serves as a connecting piece between a furring strip 10 and the shell portion 56 of the cover and need not extend the entire length of the furring strip 10. As seen in FIGURE 5, two leg portions 57 each relatively short in length, are spaced along a greater length of furring strip 10. Leg portions 57 may be, for example, 6 inches in length and placed 3 feet apart along the furring strip. If desired, however, leg portion 57 may be made as long as the furring strip 10 and shell portion 56 may be omitted entirely. When employed without a shell portion 56, leg portion 57 and particularly wing pieces 94 would serve to hide the adjacent edges of panels 12 from view.

A modified furring strip 10 is illustrated in FIGURE 6. The modified furring strip consists of an extruded aluminum strip having a flat portion 100 and two spaced projections 44 extending therefrom. The outer ends of the projections 44 are of enlarged cross-section and have lateral grooves 48 and convex tip surfaces 55 as described with respect to FIGURE 2. Spaced bolt holes 106 transversely through flat portion 100 are provided so that the surface of flat portion 100 may be secured to the wall of a building with bolts.

A suitable sequence of steps for assembling the furring strips 10 of FIGURES 1–5 into a grid for supporting the panels 12 and mullion covers 14 is apparent from the above description of the parts. Angle clips 24 and 84 are first attached to wall 16 of a building at proper locations with galvanized bolts 26. Vertical furring strips 10 may then be inserted into slots 88 in angle clips 84 and fastened in place by bolting to the projecting legs of angle clips 24 with bolts 28 and nuts 30. The horizontal furring strips 10 are placed between adjacent vertical furring strips with extending end portions 72 resting on top of the projecting slotted legs of angle clips 84. Angle clips 78 are placed in position on end portions 72 so that holes 80 align with holes 76 in the vertical furring strips 10 and with holes 74 and 86 in end portions 72 and angle clips 84 respectively. Bolts 28 may then be inserted through the aligned holes and secured with nuts 30. It should be understood that the sequence of assembly steps is not critical and may be varied as desired.

In assembling the modified furring strips 10 of FIGURE 6 into a grid, angle clips 78 and 84 are omitted. The vertical modified strips are bolted through holes 106 directly to wall 16 and short lengths of identical strips are likewise bolted to the wall after being positioned horizontally between the vertical strips. No fitting of parts at the junction of horizontal and vertical strips is necessary; the ends of the horizontal strips merely abut with the edges of the vertical strips. In practice the modified furring strips 10 would be employed when wall 16 of an extending building is sufficiently smooth and flat to permit the furring strips 10 to be attached without deforming them or subjecting them to excessive stresses. Shims would normally be inserted between flat portion 100 and the wall to allow space for the panel screws 20.

The attachment of expanded aluminum mesh panels 12 to crossbar 34 of the furring strip of FIGURES 1–5 or flat portion 100 of the modified furring strip of FIGURE 6 is readily accomplished with self-tapping screws 20. The screws 20 can be driven through the edges of the panels 12 into preformed spaced holes 25. When the panels 12 are constructed of a material which cannot be penetrated by self-tapping screws, holes must be provided in the panels to allow the screws or other fastening means to pass therethrough. The lips 35 projecting from crossbar 34 and from flat portion 100 tightly engage the panels 12 as they are fastened in place and aid in holding them against slippage.

The mullion cover 14 of FIGURES 1–3 and 6 is attached to a furring strip 10 after the panels 12 have been installed by merely placing the cover parallel to the strip so that the ends 66 of legs 58 of the cover are in contact with the convex surfaces 55 of projections 44 on the strip and forcing the cover toward the strip to engage the snap lock 22 between the two elements. As the cover 14 moves toward the strip 10, the ends 66 of legs 58 of the cover slide over the convex surfaces 55 and are thereby forced slightly apart. As the movement continues surface 54 on the end of the legs 58 passes off convex surface 55 and into engagement with the surface 64 of groove 48. Legs 58 then snap toward each other so that surfaces 50 and 52 thereof come into engagement with surfaces 60 and 62 of groove 48. Surface 54 is thus held against surface 64 and friction between the two holds the mullion cover 14 firmly to the furring strip 10.

The modified mullion cover 14 of FIGURES 4 and 5 is mounted by attaching leg portions 57 to a shell portion 56 and then snapping that combination onto a furring strip 10 in the manner described above. Each of a plurality of short leg portions are attached to a shell portion 56 by sliding flange 92 into groove 90 and inserting a screw 98 into suitable aligned holes drilled through the flange into leg 94 of the modified mullion cover. The leg portions 57 may be spaced from each other, as desired, to provide suitable support to the shell portion 56. As already indicated, a single portion 57 the same length as the furring strip 10 may be snapped on to the furring strip and the shell portion 56 omitted.

The furring strips 10 and mullion covers 14 are preferably formed of extruded aluminum for several reasons. The strips and covers being of uniform cross-section are readily produced by extrusion. In addition, aluminum is not only easily extruded but also has the properties of strength, weight corrosion resistance and pleasing appearance which are desirable in an exterior wall covering. Further, the softness of aluminum permits holes for assembling the pieces to be readily drilled and permits the use of self-tapping screws for ease in assembling the pieces. If desired, however, the strips and covers can be formed of other materials such as steel or plastic depending on such variables as size of the pieces and the required strength of the assembled covering.

The panels 12 are preferably formed of expanded aluminum mesh because this material is not only pleasing in appearance but can be attached to the furring strips 10 by self-tapping screws. The screws can be forced manually through the mesh and thus do not require that holes be preformed in the panels and aligned with holes in the furring strips 10. However, the panels may be constructed of sheet metal or plastic if desired.

It is to be understood that the invention is not limited to the precise embodiments described above and that modifications may be made within the scope of the invention.

What is claimed is:

1. In combination with the wall of a building: an open grid of elongated furring strips, each of said strips being a strip of uniform transverse cross section and having a flat longitudinal portion facing outwardly from said wall and further having adjacent said flat portion a projection forming one half of a snap-lock coupling; a panel occupying at least one open space in the grid, at least one edge of said panel overlapping the flat longitudinal portion of an adjacent furring strip; a plurality of spaced securing means passing through said one edge and through the respective longitudinal flat portion; means attaching said furring strips to said wall in a position such that said longitudinal flat portions are spaced outwardly from said wall so that said securing means do not penetrate said wall; an elongated mullion cover corresponding to each furring strip, each of said covers having uniform transverse cross-section; means forming a complementary one half of a snap-lock coupling associated with and projecting from each of said covers towards said furring strips and frictionally interlocked with the one half coupling on the corresponding furring strip, said mullion covers having skirt portions extending toward, but spaced from, any panel edge secured to the respective furring strip.

2. The combination of claim 1 wherein the flat por-

tions of said furring strips are provided with spaced holes for receiving said panel securing means and wherein said securing means include self-tapping screws forced through the panel and into said holes in said furring strips.

3. The combination of claim 1 wherein said means attaching said furring strips to said wall include a plurality of bracket means fixed to said wall and longitudinally spaced along said furring strips.

4. The combination of claim 1 wherein said furring strips and said mullion covers are extruded aluminum and wherein said panel is expanded aluminum mesh.

5. The combination of claim 1 wherein the flat portion of said furring strips has an outwardly projecting lip engaging the surface of the panel which overlaps the flat portion.

6. The combination of claim 1 wherein one of said snap-lock coupling halves includes rib means projecting from and generally coextensive with its respective structure, said rib means having a single longitudinal groove in each side defined by three generally flat intersecting surfaces; and wherein the other of said snap-lock coupling halves includes a pair of legs extending from and generally coextensive its respective structure, said legs terminating in foot portions which are complementary to said grooves.

7. The combination of claim 1 wherein said furring strips are generally T-shaped in transverse cross-section, the body of the T extending toward said wall and wherein the body on at least one of said furring strips extends longitudinally beyond the cross bar on the same furring strip and extends into close proximity with the body on another furring strip which extends at an angle to said one furring strip.

8. The combination of claim 1 in which at least one of said mullion covers is detachable from the means forming the one half snap-lock coupling associated therewith and wherein said means includes a plurality of longitudinally spaced members of uniform transverse cross-section.

9. A furring strip with attached snap-on mullion cover and wall panel comprising: an elongated furring strip member of uniform transverse cross-section, said member having a longitudinal flat surface and longitudinal rib means projecting from said flat surface at generally a right angle, said rib means defining along its outer edges one half of a snap-lock coupling; a panel member secured along one edge to said flat surface adjacent said rib means; an elongated mullion cover of uniform transverse cross-section; two leg means forming a complementary one half of a snap-lock coupling associated with and projecting from said mullion cover toward said furring strip and frictionally interlocked with the one half coupling on said furring strip, said mullion cover having a longitudinal body portion overlying said one edge of said panel member and a longitudinal skirt portion extending a substantial distance toward and spaced from said panel member; one of said snap-lock coupling halves having two grooves extending parallel to said furring strip and mullion cover and the other of said snap-lock coupling halves having a pair of spaced foot portions, each of which is complementary to and in frictional engagement with one of the grooves.

10. Apparatus as in claim 9 wherein each groove is defined by three flat surfaces, one of the flat surfaces of each groove being generally parallel to the flat surface on said furring strip and intersecting with the second flat surface at an obtuse angle, said second flat surface intersecting the third flat surface at about a right angle and wherein said third left flat surface merges with an outwardly convex surface at the extremity of the one half coupling whereby said foot portions are directed into their respective grooves.

11. Apparatus as in claim 9 wherein said furring strip is generally T-shaped in transverse cross-section, the top of the cross bar of the T forming said longitudinal flat surface.

12. Apparatus as in claim 9 wherein said longitudinal flat surface of said furring strip is provided with a lip extending toward said mullion cover and into engagement with said panel member.

13. A furring strip adapted to receive and frictionally engage a snap-on mullion cover comprising an elongated member of a genereally T-shaped transverse cross-section, said member having a single body portion and single cross bar portion, the top of the cross bar portion of the T having a pair of centrally disposed spaced ribs extending therefrom in a direction away from the body portion of the T, the edge of each rib being of enlarged cross-section and having a single longitudinal groove in the outer surface thereof for receiving and frictionally engaging a snap-on mullion cover, each groove being defined by three flat surfaces, the flat surface nearest the cross bar portion of the T being generally parallel to said cross bar portion and intersecting with the second flat surface at an obtuse angle, said second flat surface intersecting the third flat surface at about a right angle and wherein said third flat surface merges with an outwardly convex surface at the extremity of the respective rib.

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