Nov. 23, 1965 R. A. ENGHOLM 3,218,768

CURTAIN WALL FRAME CONSTRUCTION

Filed Aug. 2, 1962

FIG. 1

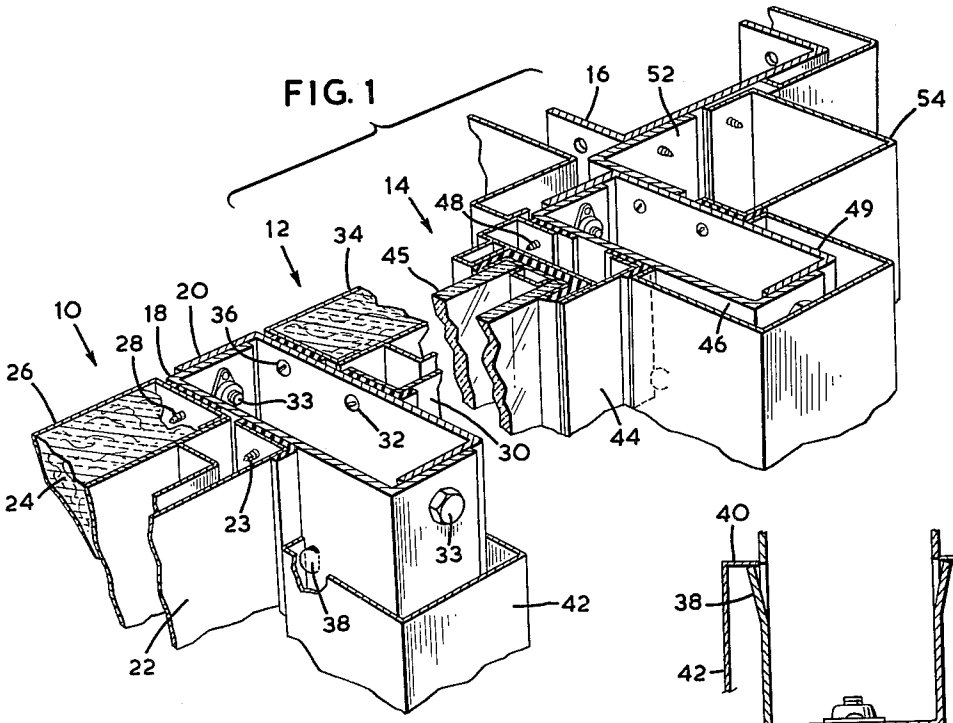
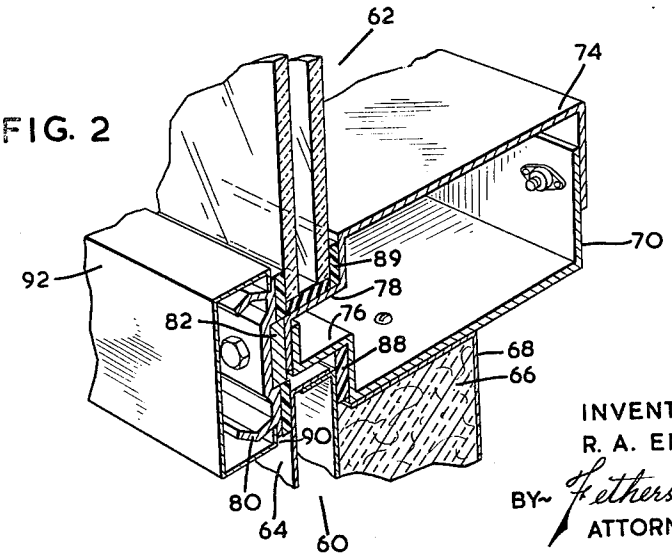


FIG. 3

FIG. 2



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CURTAIN WALL FRAME CONSTRUCTION

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This invention generally relates to prefabricated curtain wall sections. More particularly, it relates to a means for securing prefabricated curtain wall sections together.

It is practice to pre-assemble units for incorporating into a curtain wall of a building in a factory, ship them to the building location, and then connect them together on the wall of the building structure. The units are of a varied nature and can be made up of panel sections and/or window sections.

This invention relates to an improvement in the connecting for the units on the wall generally comprises a channel-shaped conenctor, base mounted on the edges of the units to be joined. Each channel-shaped connector has sides that extend outwardly from its base for abutting relation with a channel-shaped connector and another unit. The abutting sides of channel connectors are secured together by a suitable means such as bolts to join co-extensive edges of two wall units.

The invention will be clearly understood after reference to the following detailed specification read in conjunction with the drawings.

In the drawings:

FIGURE 1 is a broken horizontal section part of a wall showing the means of connection of two standard wall units in the wall of a curtain wall construction and the connection of two corner units.

FIGURE 2 is a vertical section showing an alternative means for connecting two units along co-extensive edges in which a thermal break is used.

FIGURE 3 is a sectional view illustrating a mullion cover and its means of securement.

Referring to the drawings, and at first to FIGURE 1, which shows at the left hand side a connection between a wall unit **10** and a wall unit **12**, and at the right hand side a connection between a wall unit **14** and the channelled connection **16** of a wall unit at the corner of a building.

Referring first to the interconnection of the wall units **10** and **12**, the units **10** and **12** are interconnected along vertically extending co-extensive edges by means of channel-shaped connectors **18** and **20**, which are substantially co-extensive with the edges of the panels to be joined. Unit **10** comprises a steel core panel **22** bolted at spaced apart intervals to the connector channel **18** by means of metal screws **23** and a pad of insulation **24**, held against the steel core panel **20** by means of the flanged plate **26**, also metal and secured to the connector channel **18** by means of metal screws **28**. The unit **12** is of similar construction and comprises the steel core panel **30** secured to the connector channel **20** by means of metal screws **32** and an insulation retaining panel **34** secured to the channel-shaped connector **20** by means of metal screws **36**.

In use, the panel elements and their associated connector channels are assembled in the plant, shipped to a building site, and assembled on the side of a building with their respective channel-shaped connectors **18** and **20** in abutting relation as shown.

The sides of the channel-shaped connectors **18** and **20** are formed at spaced apart intervals with holes to receive bolts **33**, whereby once arranged in place on the wall of a building they can be permanently connected at adjacent edges.

The channel-shaped connectors are very easy to fit together on the side of the building. In addition, they serve to give the pre-assembled unit rigidity during shipping because of their channel-shape.

It may be noted that the channel members **18** and **20** have a base that is broader than the edge of the unit to which they are secured and that each channel connector overhangs the base substantially to form with its mating connector a projecting mullion on the outside of the building. The overhanging portions of the bottom of the channel members are formed with detents **38** at longitudinally spaced apart locations, over which the flanged edges **40** of the channel mullion cover **42** can be flexed, as shown in FIGURE 3. When the flanged edges are so flexed, the detents form a lock against removal of the decorative mullion cover **42**.

On the right hand portion of FIGURE 1, I show a unit **14** having a connector **16** at one edge of the type used at a corner of a building in accordance with the principle of this invention.

The unit **14** in this case is a window unit having a frame **44** within which the double glazed window **45** is set. Frame **44** is screwed to the channel connector **46** by means of spaced apart bolts **48** as before. An adaptor connector member having a channel connector **49** that co-operates with the connector **46** and a channel connector **16** held at right angles to the connector **49** by means of a right angled bracket **52** is provided to dispose the channel connector **16** at right angles to the unit **14**, so that a unit on the adjacent side of the building can be interconnected as already described. Numeral **54** is a corner decorative piece.

The connectors just described are especially suited to joining wall units along their vertically extended edges. In many applications, it is not necessary to use the connection just described for horizontal extending joints.

In FIGURE 2 of the drawings, there is illustrated an alternative form of this invention that is especially adapted to the case where a thermal break in the metal between the outside and the inside of the building is required. Where a thermal break is necessary, it is usual to provide for the connection according to this invention, on the horizontally extending edges of the units as well as the vertically extending edges of the units.

In FIGURE 2, the units to be interconnected are generally indicated by the numerals **60** and **62**. Unit **60** is a unit having a steel core outside panel **64** backed by insulation referred to the numeral **66** held in place by means of the flanged panel **68**. The panels are mounted to a channel member **70** by means of screws, as described in the panel unit construction of FIGURE 1.

The unit **62** is similarly constructed to the unit **60**.

It will be noted that the channel connector members **70** and **74** are each cut away at their base as at **76** and **78**, respectively, and that an extruded clip section **80** is bolted to the sides thereof as the abutting sides of the connectors are bolted together with an insulating plastic strip **82** between the clip **80** and the channel connector members **70** and **74**. The panel **64** and the window section are mounted in the channels formed by the overhanging portions of the clip **80** and the cut-away portions of the connector members with insulating glazing beads **88** and **89**.

The clip **80**, which extends longitudinally of the joined edges and is substantially co-extensive therewith, is formed to receive the flanged edges **90** of the channelled decorative mullion **92**. It will be apparent that, as the channel **92** is slipped over the locking strip **80**, it will yield and that as it passed the inwardly sloping back edges thereof it will reassert itself to lock itself in position, as shown in FIGURE 2.

What I claim as my invention is:

1. In a curtain wall comprising a plurality of units, means joining adjacent units along co-extensive edges comprising a pair of channel-shaped connectors, said connectors having a base and sides extending from said base, one of said channel-shaped connectors being base mounted on the perimeter edge of one of said units, the other of said channel-shaped connectors being base mounted on the perimeter edge on the other of said units, each of said channel-shaped connectors being mounted as aforesaid with their sides extending outwardly of the edge of the unit upon which it is mounted, the sides of said channel-shaped connectors being in abutting relation, the side walls of said channel-shaped connectors being formed with holes at spaced apart intervals along their length and bolt means extending through said holes to join said abutting side walls of said channel-shaped connectors together whereby said co-extensive edges of said panels are joined to each other, said base of each of said channel-shaped connectors being broader than the edge of the curtain wall section upon which it is mounted and overhanging the edge thereof, the overhanging portions of said channel-shaped connectors being in opposed relation to form a mullion portion, a decorative channel-shaped cover for said mullion portion, securing means operative between the base of said overhanging portions of said channel-shaped connectors and said channel-shaped cover holding said cover in position on said overhanging portions of said channel-shaped connectors whereby to cover said connectors.

2. In a curtain wall comprising a plurality of units, means joining adjacent units along co-extensive edges

comprising a pair of channel-shaped connectors, said connectors having a base and sides extending from said base, one of said channel-shaped connectors being base mounted on the perimeter edge of one of said units, the other of said channel-shaped connectors being base mounted on the perimeter edge on the other of said units, each of said channel-shaped connectors being mounted as aforesaid with their sides extending outwardly of the edge of the unit upon which it is mounted, the sides of said channel-shaped connectors being in abutting relation, the side walls of said channel-shaped connectors being formed with holes at spaced apart intervals along their length and bolt means extending through said holes to join said abutting side walls of said channel-shaped connectors together whereby said co-extensive edges of said panels are joined to each other, said channel-shaped connectors each being formed with a longitudinally extending cut-away portion in their base, a clip secured to the side of said abutting sides of said channel members where said cut-away portions are formed therein, said clip forming a channel with the cut-away portion of said connector members, a thermal break insulating strip between said clip and the sides of said connector members.

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