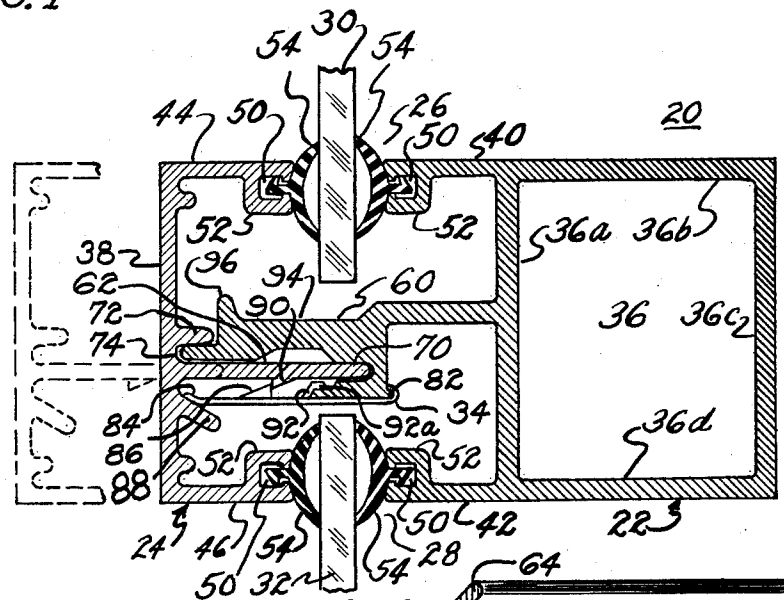
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METAL CONSTRUCTION ELEMENT

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FIG. 1



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METAL CONSTRUCTION ELEMENT

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6 Claims. (Cl. 189—34)

The present invention relates to building construction elements and more particularly to a new and improved elongated extruded metal construction element of low cost construction which may be used for many different structural purposes in fabricating building and window frames and walls. This application is a division of copending application Serial No. 96,435, filed March 17, 1961, and assigned to the same assignee as the present invention.

It is an object of the present invention to provide a new and improved extruded metal construction element of low cost construction which may be used for a number of different purposes and which has a high degree of versatility.

A further object of the present invention is to provide a new and improved extruded metal construction element.

Yet another object of the present invention is to provide a new and improved extruded metal construction element having a high degree of versatility and compatible with other components of the building wall.

The invention, together with objects and advantages thereof, will best be understood by reference to the following detailed description taken in connection with the accompanying drawing, in which:

FIG. 1 is a cross-sectional view of a mullion embodying an elongated extruded metal construction element characterized by the features of the present invention; and

FIG. 2 is a cross-sectional isometric view of the improved metal construction element according to the present invention.

Briefly, in accordance with the present invention the improved metal construction element is provided with a face portion and a main web portion normal to the face portion. The tip or end of the main web portion forms an elongated tongue for interlocking cooperation with another construction element. An L-shaped auxiliary web portion is provided with a short leg extending integrally from the main web and a long leg extending outwardly relative to the face portion and parallel to and spaced from the main web portion. Parts integrally connected to the ends of the adjacent legs define grooves for receiving annular element securing means therewithin. The main web may be provided with a longitudinally extending drain channel to provide for horizontal use of the metal construction element. The metal construction element may be integrally extruded from any suitable material such as aluminum.

Referring now to the drawing, and particularly to FIG. 1 thereof, there is illustrated a framing member or mullion shown generally at 20 and including a metal construction element 22 according to the present invention interlocked in snapped-in relation with another metal construction element 24 of suitable design, as more fully described in the aforementioned copending application, to form a pair of oppositely disposed panel receiving openings 26 and 28. The construction element 22 is adapted to be secured to the building and is hereinafter referred to as the gutter construction element, while the construction element 24 is adapted to be snapped together with the gutter construction element 22 securely holding the edge of a glass or panel securely positioned in place and is hereinafter referred to as the face construction element. A pair of panels 30 and 32 which may be glazing, such as glass or other desired panel material, is disposed

in the respective openings 26 and 28. The panels 30 and 32 have their adjacent edges within the openings in aligned spaced apart relation. The metal construction elements 22 and 24 are secured laterally together by a clip member 34 clinched to the gutter construction element 22.

In order to form the panel receiving openings 26 and 28, each of the construction elements 22 and 24 are of generally U-shaped cross section, each having a bight or faced portions 36 and 38, respectively, and a pair of end legs 40, 42 and 44, 46, respectively. The end legs 40 and 44 and the end legs 42 and 46 are aligned and spaced laterally apart to form the panel receiving openings 26 and 28. The face or bight portions 36 and 38 of the metal construction elements 22 and 24 may be of any desired extrudable shape; as illustrated, the face portion 36 is of hollow rectangular shape having sides 36*a*, 36*b*, 36*c* and 36*d*.

In order to provide for sealing of the panels 30 and 32 against the leakage of rain, water, and the like, each of the legs 40, 42 and 44, 46 is provided with a gasket receiving channel or groove 50, each formed of an L-shaped or angle-shaped member 52 having one arm 52*a* thereof (FIG. 2) integrally joined to the respective end legs 40, 42 spaced slightly inwardly from the end thereof and substantially normal therewith. Another of the arms 52*b* is spaced apart and parallel to its associated end leg 40 or 42 with the end of the arms 52*b* and the end of its associated end leg 40 and 42 being aligned in a transverse plane with respect to the construction element 22 to thereby form the longitudinally extending groove 50 for the reception of a gasket or sealing member 54. Moreover, each of the grooves 50 may contain an inwardly extending bead 58 on the inner edge of the end of its legs and arms to aid in the retention of the gasket 54.

Although the gasket 54 may have any of a plurality of desirable configurations, as more fully described in the aforementioned copending application, the sealing gaskets 54 on both sides of the panels 30 and 32 are identical and are adapted to extend in their respective channels 50. Each of the gaskets 54 is of generally arcuate or moon-shaped cross section adapted to engage a surface of a panel at its edges and additionally each of the gaskets 54 is provided with a web portion of generally hook shape adapted to be assembled in the channels 50. Although the web portions are asymmetrical in appearance, they are symmetrical in use, i.e., the hook of the webs may be turned in either direction. Since the construction elements 22 and 24 are assembled by lateral movement relative to each other, the gaskets 54 are normally preinstalled in the channel 50 prior to the assembly of the sections 22 and 24 and the panels 30 and 32. Of course, it will be appreciated that gaskets of various other configurations may be used as more fully described in the aforementioned copending application.

In order to provide for separation of the construction elements 22 and 24 at the panel receiving openings 26 and 28 in the plane of the panels 30 and 32, and to provide for interlocking of the construction elements 22 and 24 against relative rotation, each of the construction elements 22 and 24 is provided with a main web 60 and 62, respectively, which overlie and interfit with each other and which extend between the adjacent spaced apart ends of the panels 30 and 32 to separate the panel receiving openings 26 and 28. The main web 60 formed on the construction element 22 according to the present invention extends from the face portion 36 perpendicular thereto and parallel to and intermediate the end legs 40 and 42 and includes a longitudinally extending tongue portion 64, FIG. 2, formed along the lateral axis at its end remote from the face portion 36 and is additionally provided with an L-shaped auxiliary web portion 66 having a short leg 66*a* integral with the main web 60

and having a long leg 66*b* parallel to and spaced apart from the main web 60 intermediate its length and forming a groove 68 with the main web 60 for the reception of an interlocking tongue formed on the web 62. The auxiliary web portion 66 is provided with a longitudinally extending bead 66*c* along its outer surface adjacent the intersection of the long and short legs 66*b* and 66*a*, and as illustrated in the present embodiment extending laterally of the construction element 22 toward the face portion 36 thereof. Moreover, the inner edge of the long leg 66*b* in the auxiliary web portion 66 is provided with a groove or recess 66*d*.

The main web of the construction element 24 is positioned when assembled adjacent to and overlying the web portion of the construction element 22 along the side thereof provided with the groove 68 and the main web 62 is provided with a tongue portion 70, FIG. 1, received in the groove 68. Moreover, the construction element 24 is provided with a tongue or auxiliary web 72 extending from its face portion 38 parallel to and spaced apart from the main web 62 along the side thereof overlaid by the web 60 of the construction element 22 and forming a groove 74 with the main web 62 which receives the tongue 64 of the main web 60. In this manner, the tongue 64 of the construction element 22 is received within the groove 74 formed in the construction element 24 and the tongue 70 of the construction element 24 is received within the groove 68 formed in the construction element 22 so that the construction elements 22 and 24 are thereby restrained from relative rotation whether or not panels 30 or 32 are in place in the panel receiving openings 26 and 28.

In order to secure the construction elements 22 and 24 laterally together thereby to prevent the construction elements 22 and 24 from separating, the clip 34 is provided. The clip 34 is punched or otherwise formed from a strip of spring material and includes a main body portion having a plurality of aligned generally U-shaped end portions 82 along one lateral edge and having an inclined tip portion 84 along the other lateral edge. A wedge or detent 86 is struck or embossed out of the main body portion intermediate its portions 82 and 84.

To interlock the clip 34 and construction element 24, a second auxiliary web 88 is provided on the construction element 24 extending angularly from the face portion 38 and on the side of the main web 62 remote from the first auxiliary web 72. The main web 62 of the construction element 24 is additionally provided with a longitudinally extending ridge or wedge-shaped dog portion 90 intermediate its length on the side thereof remote from the first auxiliary web 72 and facing toward the auxiliary web 88. The U-shaped portions 82 of the clip 34 are hooked around the bead 66*c*, in the L-shaped web 66, and the tip portion 84 of the clip 34 engages the surface of the auxiliary web 88.

To interlock the clip 34 and construction element 22, there is struck out from the main body portion of the clip 34 a pair of ears 92 extending normal thereto prior to the assembly of the clip 34 with the construction element 22 and positioned intermediate the wedge 86 and the U-shaped portions 82. To assemble the clip 34 with the construction element 24, the portions 82 of the clip 34 are positioned around the bead 66*c* and the ears 92 extending adjacent the free edge of the long leg 66*b* of the web 66. The end of the ears 92 may then be deformed to fit in the recess 66*d* as illustrated at 92*a* in FIG. 1 and the clip 34 and construction element 24 secured in assembled relation whether or not the mating construction element 24 is in place.

It will be seen that the framing member 20 provides an arrangement which is geometrically stable even though one or both of the panels 30 and 32 are missing therefrom. Moreover, the construction elements 22 and 24 are readily assembled by a straight lateral relative movement of the construction elements 22 and 24 resulting in a maximum utilization of square cuts in the joinery, simplification of a reglazing job, and providing for either pre-installed gaskets 54 or the rolling in of the gaskets after assembly of the construction elements 22 and 24 with the panels as more fully described in the aforementioned copending application. The construction elements 22 and 24 are held against relative rotation by the tongues and grooves formed in their webs and are held rigidly against lateral separation by the clips 34. The clips 34 carry the operating loads predominantly in direct stresses, being subjected to significant bending stresses only during the snap-in assembly of the construction elements 22 and 24. The clips 34 are positively retained by the bead 66*c* and the groove 66*d* and the clips 34 may readily be replaced in the wall section without removal of the panels 30 and 32. Moreover, the clips 34 formed from a section of sheet material may be quickly and economically manufactured thus providing an economical framing member 20. The framing members 20 are readily compatible with many other commonly used systems of store fronts and building exterior components and may be economically cut to size and assembled in the field, thereby adapting the framing member 20 to small jobs as well as to larger jobs and avoiding the necessity of elaborate field measurements and assembly drawings prior to assembly.

In order that the framing member 20 be adapted to a horizontal position as well as a vertical position, the main web 60 of the construction element 22 is provided with a drainage channel 94 by the addition of a longitudinally extending bead 96 just inwardly from the end of the web 72. The framing member 20 is thereby adapted to be used as a horizontal mullion as well as a vertical mullion.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent of the United States is:

1. An integral extruded construction element of generally U-shaped cross section comprising a face portion; a pair of end legs extending generally perpendicular to said face portion from the edges thereof; a main web portion perpendicular to the face portion intermediate said end legs and extending in the same direction as said end legs, the end of said main web portion remote from said face portion forming a laterally extending tongue; an L-shaped auxiliary web portion having a short leg and a long leg, said short leg being formed integral with and generally perpendicular to said main web and said long leg extending outwardly therefrom parallel to and spaced apart from said main web intermediate the length of said main web and forming a tongue receiving groove therewith, said auxiliary web portion having a bead along its outer surface adjacent the intersection of said long and short legs extending generally parallel to said main web portion in an opposite direction from said long leg and said long leg being provided with a groove along its inner edge; longitudinal bead means on said main web portion spaced adjacent said tongue on the side of said main web portion remote from said auxiliary web portion; and an angle-shaped member integrally formed with each of said end legs having one leg joining a respective one of said end legs inwardly from the ends thereof and generally perpendicular thereto, and having its other leg spaced apart and parallel to the associated end leg, the ends of said other legs and said end legs being generally aligned in a transverse plane with respect to said construction element, and confronting beads on the inner edge of each of said other legs and said end legs to form gasket retaining means.

2. An integral extruded construction element comprising a face portion; a pair of end legs extending generally perpendicular to said face portion from the edges thereof; a main web portion perpendicular to the face portion intermediate said end legs and extending in the same di-

rection as said end legs, the end of said main web portion remote from said face portion forming a laterally extending tongue; an L-shaped auxiliary web portion having a short leg and a long leg, said short leg being formed integral with and generally perpendicular to said main web and said long leg extending outwardly therefrom parallel to and spaced apart from said main web intermediate the length of said main web and forming a tongue receiving groove therewith; longitudinal bead means on said main web portion spaced adjacent said tongue on the side of said main web portion remote from said auxiliary web portion; and an angle-shaped member integrally formed with each of said end legs having one leg joining a respective one of said end legs inwardly from the ends thereof and generally perpendicular thereto, and having its other leg spaced apart and parallel to the associated end leg, the ends of said other legs and said end legs being generally aligned in a transverse plane with respect to said construction element, and confronting beads on the inner edge of each of said other legs and said end legs to form gasket retaining means.

3. An integral extruded construction element of generally U-shaped cross section comprising a face portion; a pair of end legs extending generally perpendicular to said face portion from the edges thereof; a main web portion perpendicular to the face portion intermediate said end legs and extending in the same direction as said end legs, the end of said main web portion remote from said face portion forming a laterally extending tongue; an auxiliary web portion having one leg formed integral with and generally perpendicular to said main web and another leg extending outwardly from said first leg parallel to and spaced apart from said main web intermediate the length of said main web and forming a tongue receiving groove therewith, said auxiliary web portion having a bead along its outer surface adjacent the intersection of said legs; and seal retaining means formed at the edges of said end legs.

4. An integral extruded construction element of generally U-shaped cross section comprising a face portion; end leg means extending generally perpendicular to said face portion; a main web portion perpendicular to the face portion extending in the same direction as said end leg means, the end of said main web portion remote from said face portion forming a laterally extending tongue; an auxiliary web portion having one leg formed integral with and generally perpendicular to said main web and another leg extending outwardly therefrom parallel to and spaced apart from said main web intermediate the length of said main web and forming a tongue receiving groove therewith, said auxiliary web portion having a bead along its outer surface adjacent the intersection of said legs; and an angle-shaped member integrally formed with said end leg, means having one leg joining said end leg means inwardly from the end thereof and generally perpendicular thereto, and having its other leg spaced apart and parallel to the associated end leg means, the ends of said other leg and said end leg means being generally aligned in a transverse plane with respect to said construction element, and confronting beads on the inner edge of each of said other leg and said end leg means to form gasket retaining means.

5. A construction element comprising a face portion; seal retaining means extending from the edges of said face portion; a main web portion perpendicular to the face portion intermediate said end legs and extending in the same direction as said seal retaining means, the end of said main web portion remote from said face portion forming a laterally extending tongue; and an L-shaped auxiliary web portion having a short leg and a long leg, said short leg being formed integral with and generally perpendicular to said main web and said long leg extending outwardly therefrom parallel to and spaced apart from said main web intermediate the length of said main web and forming a tongue receiving groove therewith.

6. A construction element as set forth in claim 5 above and additionally including longitudinal bead means on said main web portion spaced adjacent said tongue on the side of said main web portion remote from said auxiliary web portion forming a drainage channel in said main web.

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