

March 19, 1963

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3,081,851

METAL CONSTRUCTION ELEMENT

Original Filed March 17, 1961

FIG. 1

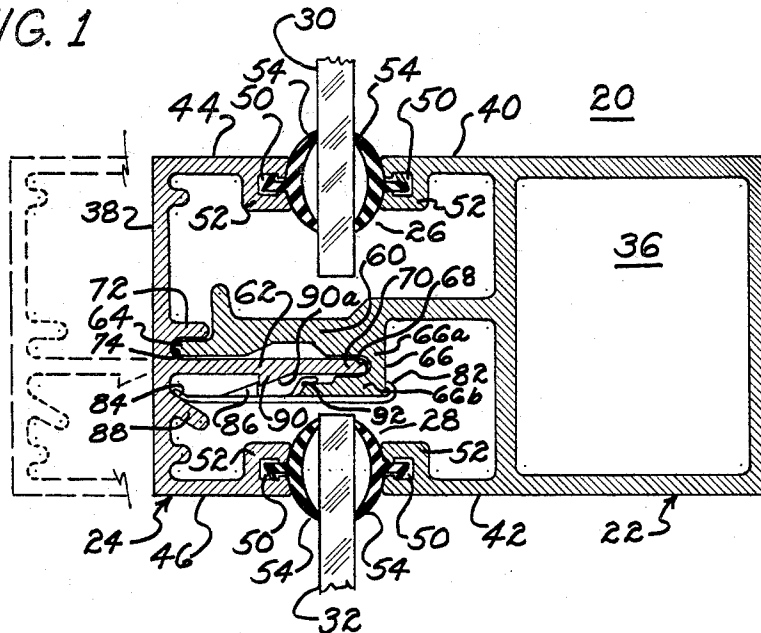
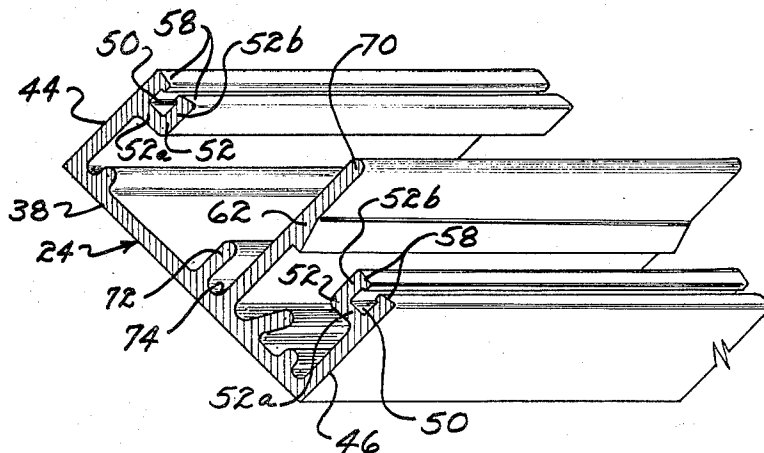


FIG. 2



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1

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METAL CONSTRUCTION ELEMENT

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Original application Mar. 17, 1961, Ser. No. 96,435.
Divided and this application July 30, 1962, Ser. No. 213,472

5 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 compatibility with other components of the building wall.

The invention together with further objects and advantages thereof will best be understood by reference to the following detailed description taken in connection with the accompanying drawings, 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 view of the present improved metal construction element.

Briefly stated, according to the present invention, there is provided an extruded construction element of generally U-shape cross section having a face portion and a pair of end legs extending generally perpendicular to the face portion from the edges thereof. A main web portion normal to the face portion is provided intermediate the end legs and includes a longitudinally extending surface inclined transversely outwardly away from the face portion to provide a wedge-shaped dog portion. Moreover, a first auxiliary web extends integrally from the face portion to form a tongue-receiving groove and a second auxiliary web extends integrally from the face portion angularly away from the main web portion on the other side thereof. Each of the end legs is provided at its ends with gasket receiving means.

Referring now to the drawings, there is illustrated in FIG. 1 a framing member or mullion shown generally at 20 and including a pair of interlocked, snapped-in, extruded construction elements including a first construction element 22, hereinafter referred to as a gutter construction element, and a second construction element 24 according to the present invention and hereinafter referred to as a face construction element. The construction elements 22 and 24 are interfitted and interlocked to form a pair of oppositely disposed panel receiving openings 26 and 28. 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 26 and 28 in aligned spaced apart relation. The 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

2

28, each of the construction elements 22 and 24 are of generally U-shaped cross sections, each having a bight or face portion 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 in laterally spaced apart relation to form the panel receiving openings 26 and 28. As herein illustrated, the face portion 38 of the construction element 24 comprises a single bar interconnecting the end legs 44 and 46. However, it is to be understood that the face portion 38 may be of any desirable extrudable shape, such, for example, as of hollow rectangular shape as more fully described in the above-mentioned copending application.

In order to provide for sealing of the panels 30 and 32 against the leakage of rain, water, and the like, each of the end legs 44 and 46, as well as the end legs 40 and 42, is formed with a gasket-receiving channel or groove 50, each formed of an L-shaped or angle-shaped member 52, best seen in FIG. 2, having one arm 52a thereof integrally joined to its respective end leg inwardly from the end thereof and substantially normal thereto. Another of the arms 52b is spaced apart and parallel to its associated end legs with the end of the arms 52b and the end of its associated end legs being aligned in a transverse plane with respect to the construction element 24 to thereby form the longitudinally extending grooves 50 for reception of gaskets or other sealing members 54. If desired, each of the grooves 50 may contain an inwardly extending bead 58 on the inner edge of each of its legs to aid in the retention of the gasket 54.

The gaskets 54 may have a plurality of desirable configurations, and as illustrated in FIG. 1 the sealing gaskets 54 are all identical and are adapted to extend into their respective channels 50. Each of the gaskets 54 is of generally arcuate or moon-shaped cross sections 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 channel 50 of the framing member 20. Although the web portions are asymmetrical in appearance as shown, they are symmetrical in use; i.e., the hook of the web 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 pre-installed in the channels 50 prior to the assembly of the construction elements 22 and 24 and the panels 30 and 32. Of course, it will be appreciated that gaskets of various configurations may be used and, as more fully described in the aforementioned copending application, the gaskets may be adapted to be rolled in after assembly of the construction elements 22 and 24 into the framing member 20.

In order to provide for separation of the construction elements 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 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.

Referring first to the main web 60 formed on the construction element 22, the main web 60 extends from the face portion 36 thereof parallel to and intermediate the end legs 40 and 42 thereof and includes a tongue portion 64 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 66a integral with the main web 60 and having a long leg 66b parallel to and spaced apart from the main web 60 intermediate the length of the main web 60 and forming a tongue-receiving groove 68 with the main web 60.

The main web 62 of the construction element 24 is positioned when assembled adjacent to and overlying the web portions of the construction element 22 along the side thereof provided with the groove 68 and the main web 62 is provided with a laterally extending tongue portion 70 formed at its end and received in the groove 68.

The construction element 22 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 overlayed by the web 62 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 the panels 30 and 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 preventing the construction elements 22 and 24 from separating, the clip 34 is provided. The clip 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 out of the main body portion intermediate its portions 82 and 84. A second auxiliary web 88 is provided on the construction element 24 extending from the face portion 38 angularly away from the web 62 and on the side thereof remote from the first auxiliary web 72 to form a clip retaining groove. 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 80 are hooked around a bead on the L-shaped web 66 and the tip portion 84 of the clip 34 engages the surface of the auxiliary web 88.

In order to secure the clip 34 in place during the assembly of the construction elements 22 and 24, the main body portion thereof additionally has struck out therefrom 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 a bead of the auxiliary web 66 with the ears 92 extending adjacent the free ends of the long leg 66b of the web 66. The ends of the ears 92 may then be deformed to clinch the clip 34 to the construction element 22.

In order to permit the construction elements 22 and 24 to be assembled by a lateral movement relative to each other, the dog portion 90 of the auxiliary web 62 is provided with a longitudinally extending surface 90a inclined transversely inwardly away from the face portion 38 of the construction element 24.

The method of assembly of the construction elements 22 and 24 is illustrated in phantom in FIG. 1. The clip 34 is first assembled with the gutter construction element 22. The construction element 24 is then positioned laterally of its final position, as indicated in phantom, and is moved laterally relative to the construction element 22, the tongue 70 thereof fitting into the groove 68 and the tongue 64 of the construction element 22 fitting into the groove 74 of the construction element 24. The gaskets 54 have been assembled in their respective grooves 50 and the panels 30 and 32 have preferably been previously placed in position. As the construction elements 22 and 24 are moved toward each other, the inclined surface 90a of the dog portion 90 of the construction element 24

moves over the wedge 86 on the clip 34, deforming the clip 34 in bending. Further movement of the construction elements 22 and 24 relative to each other will cause the dog portion 90 to slide over the edge of the wedge 86 and the clip 34 will spring to the position illustrated in FIG. 1. Once assembled, the construction elements 22 and 24 are held from lateral separation through the interference of the dog portion 90 and the wedge 86 on the clip 34. It will be appreciated that the clip 34 is loaded primarily in direct and shear stresses and the bending load 34 is negligible. Forces in the framing member 20 which tend to separate the construction elements 22 and 24 will be reacted through the engagement of the U-shaped portion 82 of the clip 34 with the auxiliary web 66 causing compression in the wedge 86 and tension in the portion of the main body from the wedge 86 to the portion 82. In this manner, the construction elements 22 and 24 are rigidly held together, the resiliency of the clip 34 in direct and shear loadings being negligible as compared with the bending of the clip. The auxiliary web 88 functions to prevent the tip 84 of the clip 34 from moving out away from the web 60 in response to bending movement in the body of the clip, thus preventing disengagement of the construction elements.

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 motion resulting in the maximum utilization of square cuts in the joinery, simplification of a reglazing job, and providing for either pre-installed gaskets 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 carrying the operating loads predominantly in direct stresses; the clips 34 being subjected to significant bending stress only during the snap-in assembly of the construction elements 22 and 24. The clips 34 are positively retained by the auxiliary web 66 and the clips 34 may readily be replaced in a wall section without movement of the panels 30 and 32. Moreover, the clip 34, formed from a section of sheet metal, may quickly and economically be manufactured thus providing an economical framing member 20. The framing members 20 are readily compatible with many of the commonly used systems of store front 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.

Although the present invention has been described by reference to only a single embodiment thereof, it will be apparent that numerous other modifications and embodiments may be devised by those skilled in the art and it is intended by the appended claims to cover all such modifications and embodiments which will fall within the true spirit and scope of the present 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 forming a laterally extending tongue; a wedge-shaped dog portion provided on said main web portion laterally intermediate its ends and including a longitudinally extending surface inclined transversely inwardly away from said face portion; a first auxiliary web extending integrally from said face portion parallel to and spaced apart from said main web and forming

5

a tongue-receiving groove therewith; a second auxiliary web extending integrally from said face portion and angularly away from said main web on the side thereof remote from said first auxiliary web; 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 end 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 direction as said end legs, the end of said main web portion forming a laterally extending tongue; a wedge-shaped dog portion provided on said main web portion laterally intermediate its ends; means associated with said main web portion forming a tongue-receiving groove therewith; additional means associated with said main web to form a clip retaining groove; 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 end 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 forming a laterally extending tongue; a wedge-shaped dog portion provided on said main web portion laterally intermediate its ends and including a longitudinally extending surface inclined transversely inwardly away from said face portion; a first auxiliary web extending integrally from said face portion parallel to and spaced apart from said main web and forming a tongue-receiving groove therewith; a second auxiliary web extending angularly away from said main web on the side thereof remote from said first auxiliary web; and seal-retaining means formed at the edges of said legs.

6

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 forming a laterally extending tongue; a dog portion provided on said main web portion laterally intermediate its ends and including a longitudinally extending surface inclined transversely inwardly away from said face portion; a first auxiliary web extending integrally from said face portion parallel to and spaced apart from said main web and forming a tongue-receiving groove therewith; a second auxiliary web extending angularly away from said main web on the side thereof remote from said first auxiliary web; 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 forming a laterally extending tongue; a wedge-shaped dog portion provided on said main web portion laterally intermediate its ends and including a longitudinally extending surface inclined transversely inwardly away from said face portion; a first auxiliary web extending integrally from said face portion parallel to and spaced apart from said main web and forming a tongue-receiving groove therewith; and a second auxiliary web extending angularly away from said main web on the side thereof remote from said first auxiliary web.

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