

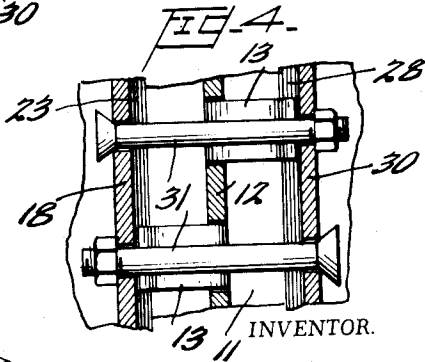
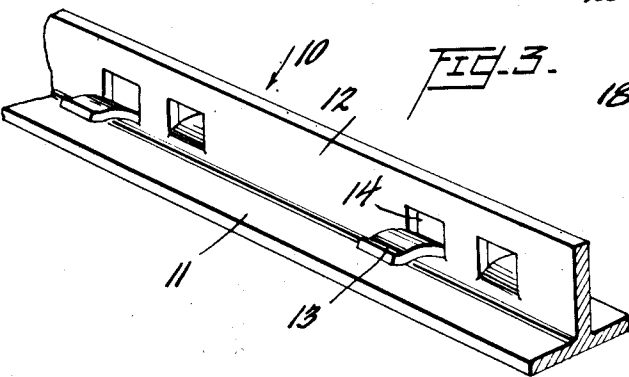
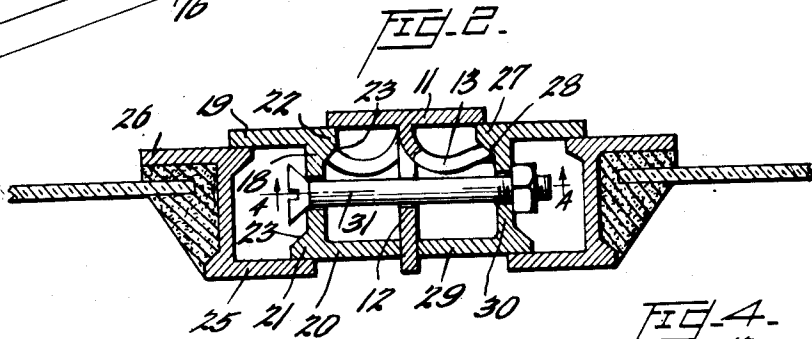
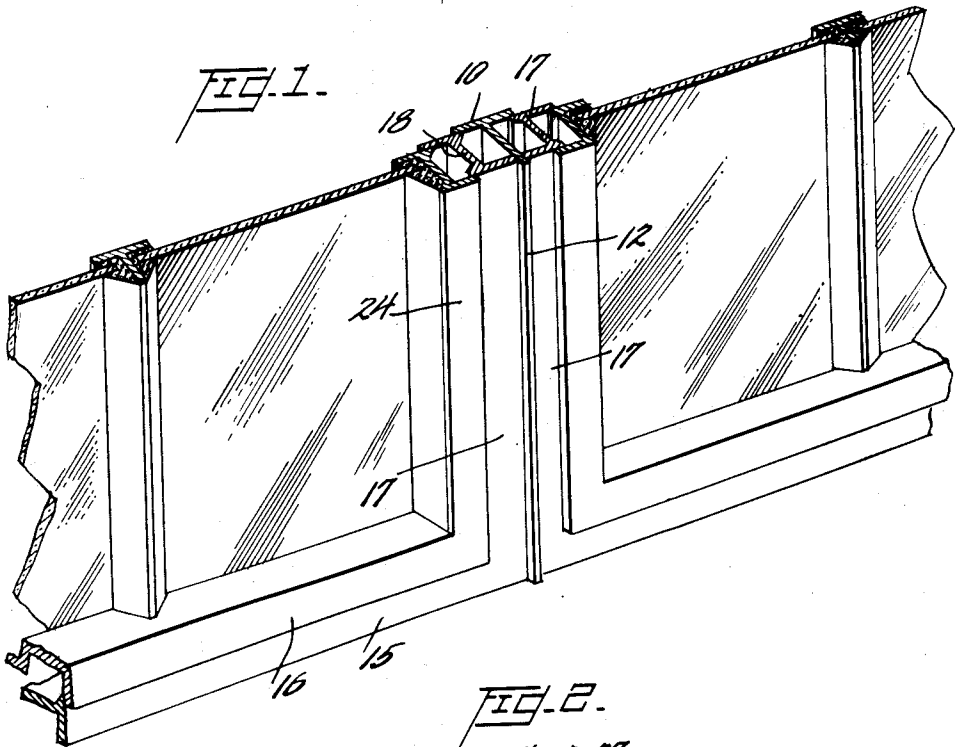
Oct. 28, 1952

R. H. BLISS, JR

2,615,539

MULLION

Filed April 7, 1949



INVENTOR.
BY Robert H. Bliss, Jr.
By Watson, Cole, Krinkle & Watson
ATTORNEYS

UNITED STATES PATENT OFFICE

2,615,539

MULLION

Robert H. Bliss, Jr., East Syracuse, N. Y.

Application April 7, 1949, Serial No. 86,067

7 Claims. (Cl. 189-75)

1

This invention relates to metallic window structures, and more particularly to an improved mullion adapted to be positioned intermediate parallel closely spaced end members of the frames of adjacent windows of a series of windows disposed in side-by-side relationship.

The window opening of the standard metallic window casement is of relatively small size and, it is frequently desirable to utilize a plurality of such windows in side-by-side relationship in order to obtain the necessary or a desired total ventilating or lighting area. Mullions or supporting bars are customarily interposed between the side members of adjacent frames, to provide the necessary stability in the built-up assembly.

The separator bar, or mullion, heretofore generally used, comprises a T-bar provided with a series of apertures in the web of the bar, through any one of which may be passed a fastening means, generally a bolt which also extends through apertures in the side frame members of the casements which are arranged in side-by-side relationship on either side of the interposed mullion. The head flange of the T-bolt is generally positioned so that either end of the head flange abuts against an end surface of the adjacent casements. This obtains the desired spacing between the casements and provides one of the weather seals which are provided between the casements which are to be joined.

The precise position of a mullion of this type between the casements is made to depend upon the fastening bolt supporting the mullion in position between the casements by bearing against one edge of the metal defining the apertures in the web of the mullion. Accordingly, the size of the aperture must be made only slightly larger than the diameter of the fastening bolt in order to restrain the mullion in a predetermined proper position with respect to the casements. The small clearance which is thus permissible between the bolt and the web often results in the threads of the bolt being burred when the bolt is inserted.

The principal difficulty, however, in utilizing the type of mullion heretofore employed results when the fastening means between the two casements being joined is drawn up tightly to ensure a weather-proof contact between the two casements and the interposed mullion. This operation frequently results in the edges of the head flange, which engage and position the end members of the casements, being displaced towards the fastening means. This movement of the edges of the head flange lessens at one point the

2

distances by which the casements are separated, and the casements are caused to swing slightly out of alignment. The movement away from alignment reduces the flush surface-to-surface weather seals between the casements and the mullion to a point-to-point contact as well as causing the casements to draw out of the rough wall opening in which they are to be fixed.

It is one of the objects of this invention to provide a mullion for uniting casement windows which is not subject to displacement, and which is adapted to securely form and maintain weather sealing contact between the casements being joined together and the mullion regardless of the force which is applied to the fastening means.

It is a further object of the invention to provide a mullion in which a spacing element and a weather sealing contact surface are so arranged that increased pressure applied by the fastening means will result in more secure weather sealing contact between the casement and the mullion.

A further object is to provide a mullion which affords two weather sealing contacts between the mullion and the casements and which at the same time lends an improved appearance to the finished window assembly.

Other objects and advantages of the invention will be apparent from the following description made with reference to the accompanying drawings. Similar reference numerals denote similar elements throughout the drawings.

In the drawings:

Figure 1 is a perspective view of a casement window illustrating the manner in which casement windows are arranged with respect to a T-mullion embodying the instant invention when the T-mullion is employed to join together the casement windows;

Figure 2 is a transverse section along the lines 2-2 of Figure 1 illustrating in detail the manner in which the mullion may be utilized in joining two casement windows;

Figure 3 is a perspective view of one form of the T-mullion which may be employed in practicing the invention; and

Figure 4 is a longitudinal section along the lines 4-4 of Figure 2.

The T-mullion 10 illustrated in Figure 3 of the drawings discloses one form of mullion which may be employed in accordance with the invention. The mullion comprises a head flange 11 which is formed normal to the web 12 at one edge of the web. The web is provided with a series of tabs 13 along the length of the web at spaced intervals. In the T-mullion illustrated,

the tabs are formed by punching out portions of the web 12 at the desired intervals along the length of the web. The apertures 14 formed in the web are adapted to pass a fastening means, generally a bolt or its equivalent, that secures in fixed position with respect to the mullion the casement windows which are to be joined together, as hereafter further described.

In the event the series tabs 13 are formed along the length of the web otherwise than by punching out portions thereof, the apertures 14 are provided at regular intervals by a tapping, drilling or punching operation. It is apparent, however, that it is most practical to produce the tabs and the apertures by a single punching operation although equivalent means may be otherwise provided.

The described mullion is particularly adapted to be employed to unite in a series casement windows of the type illustrated in Figures 1 and 2. These windows comprise a frame, a portion of which is indicated generally at 15 and a swinging sash 16 which is pivoted to the frame along a vertical edge of the sash (not illustrated). Figure 1 illustrates two such casement windows aligned in side-by-side relationship with a T-mullion 10, interposed between the casements to provide a stable and tight joint between the casements. It will be understood that the mullion herein described may be utilized to join together casement windows along their adjacent horizontal edges as well as along their adjacent vertical edges as particularly illustrated in the drawings for purposes of simplifying the explanation of the invention. Accordingly, the expression "casement windows in side-by-side relationship," or equivalent expression, as used herein are intended to comprise a column of casement windows as well as a row of casement windows.

The vertical end members 17 of the casements illustrated in Figure 1 of the drawings are similar in construction, and the following description of the members 17 will be made with reference to the member to the left in Figures 1 and 2.

The vertical end piece 17 of the casement frame which is engaged by the mullion in making the desired joint comprises a Z-bar which has a web 18 and flanges 19 and 20 formed at either edge of the web normal to the plane of the web. The Z-bar is also provided with ribs 21 and 22 which are partially constituted by extensions of the flanges 19 and 20 respectively slightly beyond either side of the web 18. The outer surfaces of the ribs are continuations of the flat plane of the outer surfaces of the flanges 19 and 20. The opposed surfaces 23 of the ribs 21 and 22 are beveled, and slope into the sides of the web.

The vertical sash mullion 24 comprises a similarly formed Z-bar. This construction permits double weather sealing contact surfaces between the frame 15 and the swinging sash 16, in that in closed position the outer flange 25 of the sash mullion 24 seats against the rib 21 of the frame, and the rib 26 of the sash mullion seats against the flange 19 of the vertical frame end member 17.

One feature of the present invention resides in the manner in which rib elements of the vertical end pieces 17 which serve the above described purpose are additionally utilized to provide additional stability and weather-tightness in the mullion joint between the casements.

The joint between the casements is made by placing the casements in a side-by-side relation-

ship and inserting the T-mullion 10 between the casements in the manner illustrated in Figure 2 of the drawings. The under surfaces of the margins of the head flange 11 of the mullion bear closely against the flat surfaces of the ribs 22 and 27, respectively, of members 17. Alternate tabs of the series of tabs 13 extend in opposite directions from the web 12 of the mullion, as most clearly illustrated in Figures 2 and 4, and the free ends of these tabs engage the beveled surfaces 23 and 28 of the ribs 22 and 27, respectively. The flanges 20 and 29 of the vertical end frame members of the casements engage the oppositely facing side surfaces of the distal end of the web 12 of the mullion.

The webs 18 and 30 of the vertical end frame members are provided with a series of apertures which are positioned to register with the apertures 14 provided in web of the mullion. The casements are held in fixed relationship with respect to the mullion by a series fastening means 31 which are passed through the registering apertures in the vertical end frame members of the casements and the mullion.

As the fastening means are drawn tight the ends of the tabs 14 will tend to move downwardly along the beveled surfaces 23 and 28 of the ribs 22 and 27, respectively. This will cause the under side of the margins of the head flange 11 of the mullion to more securely engage the flat surface of the ribs 22 and 27. Further tightening of the fastening means will merely cause the engagement between the surfaces to become more secure. A positive limit of the engaging movement is obtained when the ends of the tabs have moved downwardly along the beveled surfaces to the point where the ends of the tabs engage the junctions between the webs and the beveled surfaces of the ribs. The predetermined positioning or distancing of the casements may also be obtained by forming the tabs with rigidity sufficient to resist material displacement downwardly along the beveled surface thereby maintaining the casements at approximately the distance at which the tabs initially engage the beveled surfaces of the ribs.

It will be apparent from the foregoing that efficient weather sealing contacts are formed along two surfaces of the assembled casements, namely, between the outer flanges 20 and 29 and the distal end of the web 12, and between the under surfaces of outer margins of the head flange 11 and the flat surface of the ribs 22 and 27.

It will be observed, therefore, that the rib elements of the double sealing type casement frame is utilized in conjunction with the described T-mullion to obtain a joint between casements having unusual weather-tightness, and having stability at a positively predetermined distance between the casements.

It will be further appreciated that the wedging action, obtained by the movement of the distal end of the tab 13 along the beveled surfaces 23 and 28 as the fastening means is taken up, which causes the tight engagement between the lateral margins of the T-mullion head flange 11 and the outwardly facing surfaces of the casements arranged on either side of the mullion may be accomplished by providing co-operating wedging surfaces on the adjacent edge members of the casements and the mullion otherwise than specifically illustrated in the drawings. For example, a wedging surface may be formed at any point on the intermediate section of the end member webs 18 and 30 and the tabs arranged

so that the co-operating wedging surface of the tab engages the wedging surfaces formed on the intermediate portions. Such an arrangement is considered to be the full equivalent of that illustrated in the drawings and heretofore specifically described.

In its preferred form the invention comprises the arrangements heretofore described which act to simultaneously effect a tight engagement between the outer margins of the head flange of the mullion and the outer faces of the adjacent edge members, as well as spacing the adjacent edge members of the sashes arranged in side-by-side relationship at a predetermined distance. However, the tabs 13 of the mullion may be arranged to function only as spacing members by dispensing with the wedging surfaces formed on the adjacent edge members of the casements and arranging the tabs to engage the casement edge members and position them at a predetermined distance when the fastening means is drawn tight.

The invention also contemplates arrangements wherein some of the projections or tabs formed on the web of the mullion function to wedge the head flange of the mullion into tight engagement with the outwardly facing surfaces of the casement units while other of the tabs or projections formed on the mullion web serve to engage the casement edge members and position the edge members at a predetermined distance as the edge members are drawn toward each other into tight engagement with the spacing projections or tabs formed on the web of the mullion.

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

1. A casement window having frame end members comprising a web provided with a series of apertures at spaced intervals along its length, a longitudinally extending flange normal to the web formed at one edge of the web, a longitudinally extending rib formed at the other edge of the web projecting a short distance relative to said flange from the same side of the web as the said flange, a second casement window having the same frame end member construction arranged side-by-side with the first named casement window: in combination with a T-mullion, said T-mullion being interposed between the two said casement windows and having a head flange, a web, a series of tabs secured to either side of the mullion web at spaced intervals along the length of the mullion web, a series of apertures provided in the mullion web along its length positioned to register with the apertures provided in the said end members, said head flange engaging toward either end thereof one surface of the projecting portion of the ribs of either of said casement end members, said tabs engaging the opposed surface of the projecting portion of said ribs, the said flanges of the casement end members engaging either side of the web of the said mullion, and a fastening means passing through said registering apertures whereby the said end members and said mullion are fixed rigidly in the described relationship.

2. A casement window having frame end members comprising a web provided with a series of apertures at spaced intervals along its length, a longitudinally extending flange normal to the web formed at one edge of the web, a longitudinally extending rib formed at the other edge of the web projecting a short distance relative to said flange from the same side of the web as the

said flange, said rib being provided with a flat surface normal to said web and an opposed beveled surface sloping into one side of said web, a second casement window having the same frame end member construction arranged side-by-side with the first named casement window: in combination with a T-mullion, said T-mullion being interposed between the two said casement windows and having a head flange, a web, a series of tabs secured to either side of the mullion web at spaced intervals along the length of the mullion web, a series of apertures provided in the mullion web along its length positioned to register with the apertures provided in the said end members, said head flange engaging toward either end thereof the flat surface of the projecting portion of the ribs of either of said casement end members, said tabs engaging the opposed beveled surface of the projecting portion of said ribs, the said flanges of the casement end members engaging either side of the web of the said mullion, and a fastening means passing through said registering apertures whereby the said end members and said mullion are fixed rigidly in the described relationship.

3. A casement window having frame end members comprising a web provided with a series of apertures at spaced intervals along its length, a longitudinally extending flange normal to the web formed at one edge of the web, a longitudinally extending rib formed at the other edge of the web projecting a short distance relative to said flange from the same side of the web as the said flange, a second casement window having the same frame end member construction arranged side-by-side with the first named casement window: in combination with a T-mullion, said T-mullion being interposed between the two said casement windows and having a head flange, a web, a series of tabs formed integrally with said mullion web and positioned alternately to either side of the plane of the mullion web, a series of apertures provided in the said mullion web along its length and positioned adjacent to the length and positioned adjacent to the said tabs and in registration with the apertures provided in the said end members, said head flange engaging toward either end thereof one surface of the projecting portion of the ribs of either of said casement end members, said tabs engaging the opposed surface of the projecting portion of said ribs, the said flanges of the casement end members engaging either side of the web of the said mullion, and a fastening means passing through said registering apertures whereby the said end members and said mullion are fixed rigidly in the described relationship.

4. A casement window having frame end members comprising a web provided with a series of apertures at spaced intervals along its length, a longitudinally extending flange normal to the web formed at one edge of the web, a longitudinally extending rib formed at the other edge of the web projecting a short distance relative to said flange from the same side of the web as the said flange, said rib being provided with a flat surface normal to said web and an opposed beveled surface sloping into one side of said web, a second casement window having the same frame end member construction arranged side-by-side with the first named casement window: in combination with a T-mullion, said T-mullion being interposed between the two said casement windows and having a head flange, a web, a series of tabs formed integrally with said mullion

web and positioned alternately to either side of the plane of the mullion web, a series of apertures provided in the said mullion web along its length and positioned adjacent to the length and positioned adjacent to the said tabs and in registration with the apertures provided in the said end members, said head flange engaging toward either end thereof the flat surface of the projecting portion of the ribs of either of said casement end members, said tabs engaging the opposed beveled surface of the projecting portion of said ribs, the said flanges of the casement end members engaging either side of the web of the said mullion, and a fastening means passing through said registering apertures whereby the said end members and said mullion are fixed rigidly in the described relationship.

5. A casement window comprising more than one section, each said section having a frame and being arranged in a side-by-side relationship, the end frame members of said sections comprising a web provided with a series of apertures at spaced intervals along its length, a longitudinally extending flange normal to the web formed at one edge of the web, a longitudinally extending rib formed at the other edge of the web projecting a short distance relative to said flange from the same side of the web as the said flange, a T-mullion interposed between the said vertical end members of each of said sections, said mullion comprising a head flange, a web, a series of tabs secured to either side of the mullion web at spaced intervals along the length of the mullion web, a series of apertures provided in the mullion web along its length positioned to register with the apertures provided in the said end members, said head flange engaging toward either end thereof one surface of the projecting portion of the ribs of either of said casement end members, said tabs engaging the opposed surface of the projecting portion of said ribs, the said flanges of the casement end members engaging either side of the web of the said mullion, and a fastening means passing through said registering apertures whereby the said end members and said mullion are fixed rigidly in the described relationship.

6. A casement window comprising more than one section, each said section having a frame and being arranged in a side-by-side relationship, the end frame members of said sections comprising a web provided with a series of apertures at spaced intervals along its length, a longitudinally extending flange normal to the web formed at one edge of the web, a longitudinally extending rib formed at the other edge of the web projecting a short distance relative to said flange from the same side of the web as the flange, said rib being provided with a flat

surface normal to said web and an opposed beveled surface sloping into one side of said web, a T-mullion interposed between the said vertical end members of each of said sections, said mullion comprising a head flange, a web, a series of tabs secured to either side of the mullion web at spaced intervals along the length of the mullion web, a series of apertures provided in the mullion web along its length positioned to register with the apertures provided in the said end members, said head flange engaging toward either end thereof the flat surface of the projecting portion of the ribs of either of said casement end members, said tabs engaging the opposed beveled surface of the projecting portion of said ribs, the said flanges of the casement end members engaging either side of the web of the said mullion, and a fastening means passing through said registering apertures whereby the said end members and said mullion are fixed rigidly in the described relationship.

7. In a casement window construction of the type having a series of windows fixed in a side-by-side relationship, each end member of said windows having a laterally projecting portion, a T-mullion interposed between each of the adjacent end members, said T-mullion comprising a head flange, a web, a series of tabs secured to the web at spaced intervals along its length, said tabs being positioned generally parallel to the plane of said head flange, a series of apertures provided in the web along its length, fastening means joining said adjacent end members passing through said apertures, said head flange engaging towards either end thereof a said laterally projecting portion of one of said end members, said tabs engaging the opposed surfaces of said laterally projecting portions, whereby a double sealing contact between said adjacent end members and said T-mullion is established, and said end members are fixed in the described relationship.

ROBERT H. BLISS, JR.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,046,444	Crittall	Dec. 10, 1912
1,659,955	Loescher	Feb. 21, 1928
1,780,852	Sullivan	Nov. 4, 1930
2,472,162	Kuney et al.	June 7, 1949

FOREIGN PATENTS

Number	Country	Date
663,372	France	Apr. 8, 1929