March 10, 1942. J. E. CASSE 2,275,730

REMOVABLE MULLION

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Fig. 1.

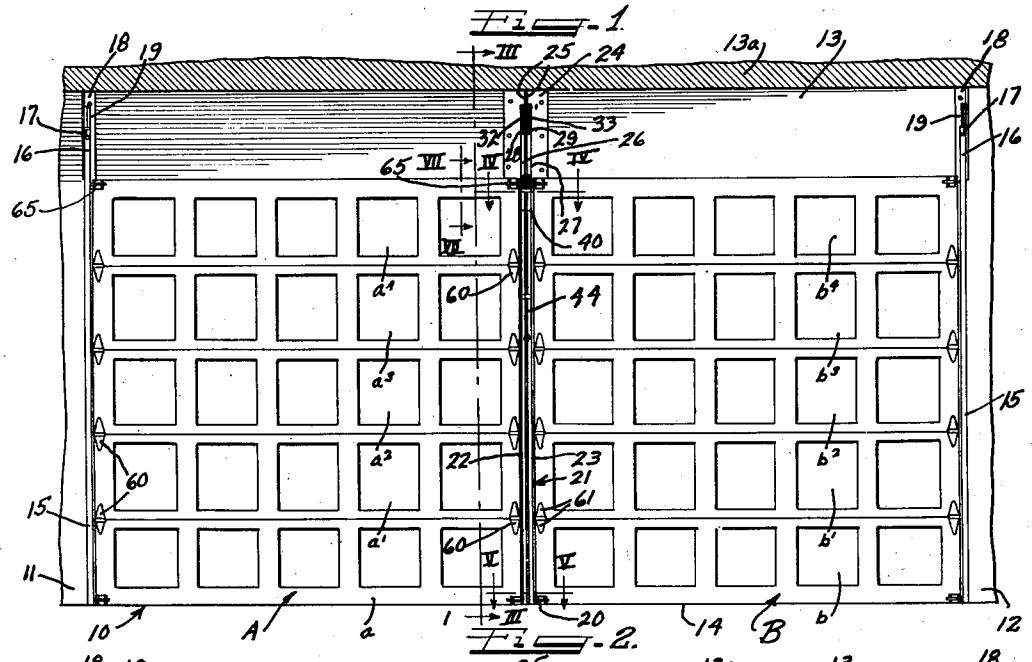


Fig. 2.

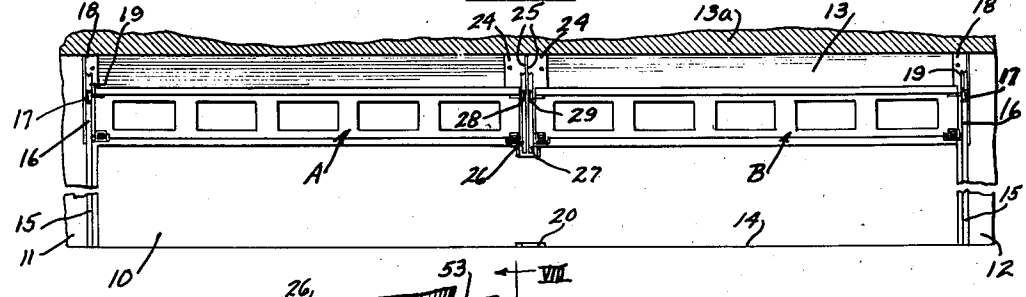
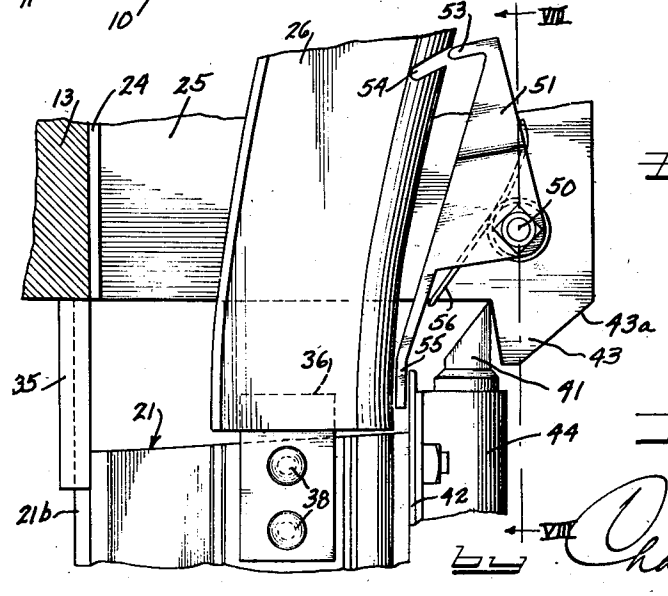


Fig. 7.



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Fig. 3.

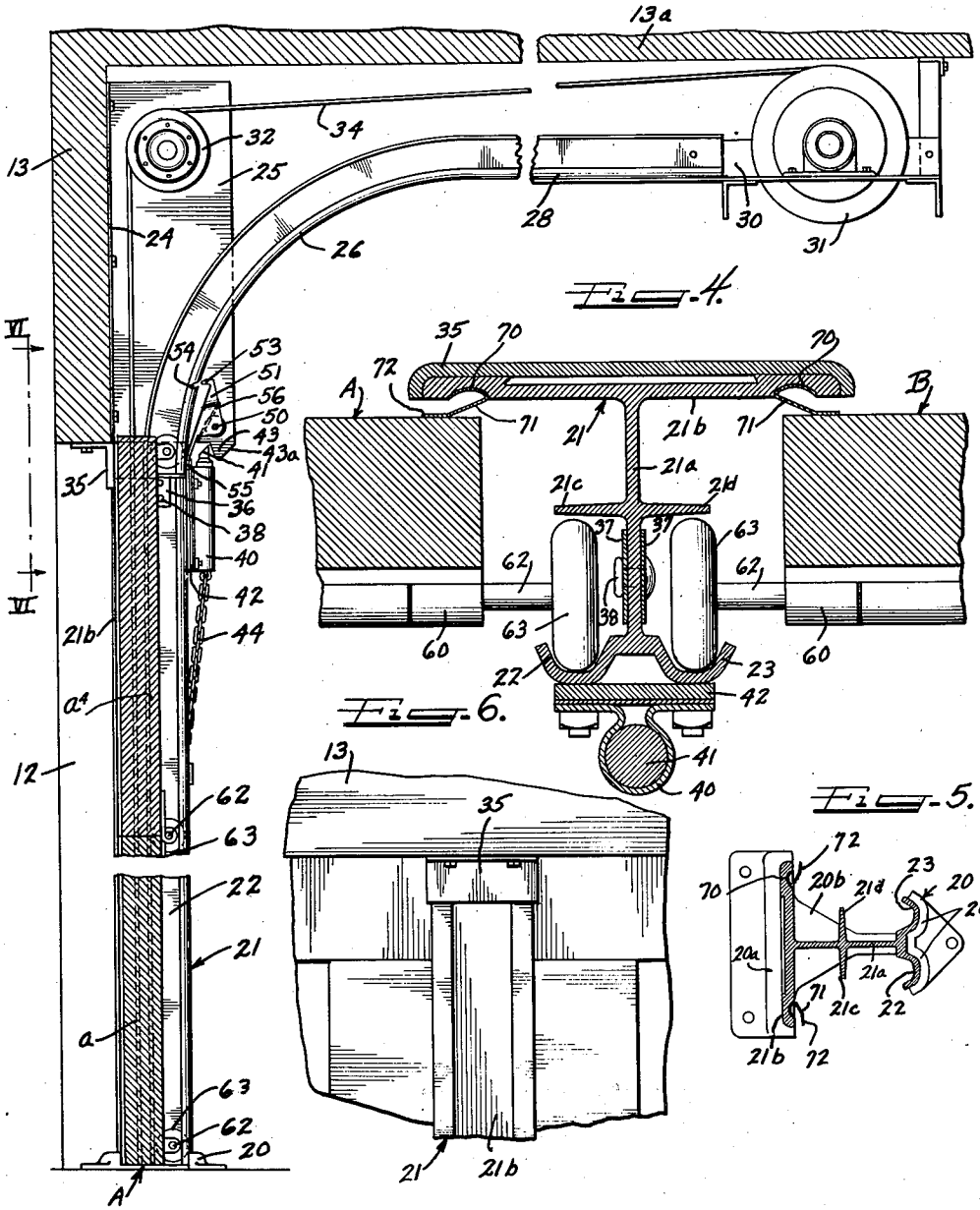


Fig. 4.

Fig. 6.

Fig. 5.

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Fig. 8.

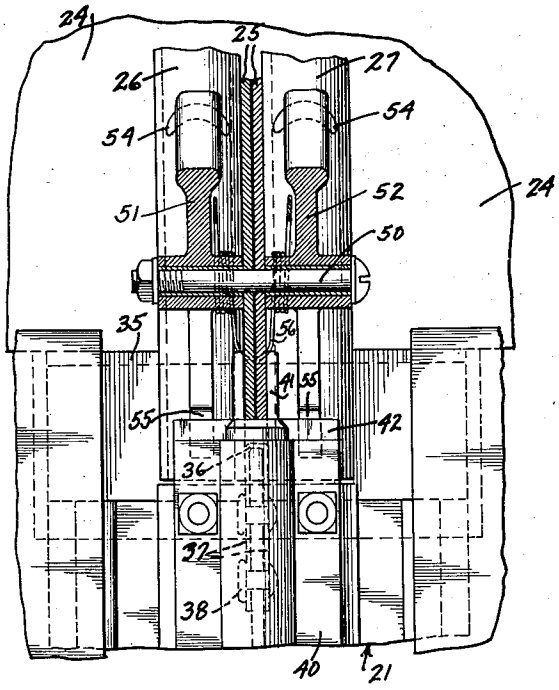


Fig. 9.

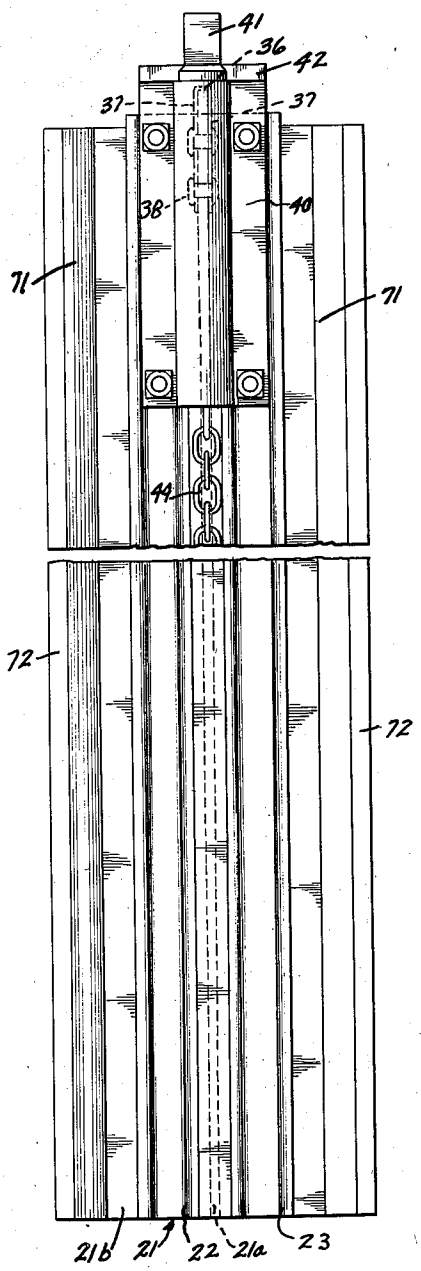
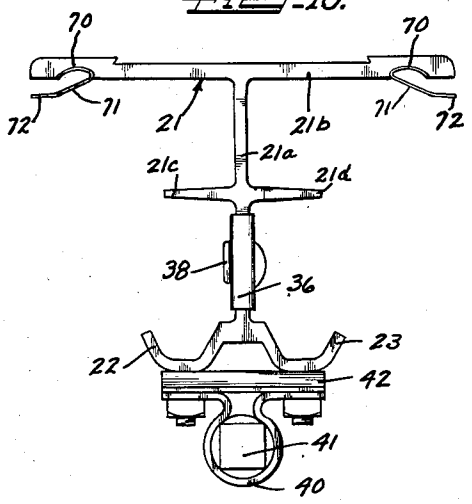


Fig. 10.



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Patented Mar. 10, 1942

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UNITED STATES PATENT OFFICE

2,275,730

REMOVABLE MULLION

Joseph E. Casse, Detroit, Mich., assignor to Crawford Door Company, Detroit, Mich., a corporation of Michigan

Original application January 13, 1939, Serial No. 250,688. Divided and this application March 9, 1940, Serial No. 323,060

3 Claims. (Cl. 20—20)

This invention relates to a removable mullion or stile construction adapted for mounting between adjoining closures for an opening such as a doorway.

More specifically the invention relates to a removable vertical mullion or stile, for upward acting door constructions having adjoining doors, that is adapted to be bodily removed from the doorway when the doors are in open position to provide an unobstructed opening.

This application is a division of my copending application Serial No. 250,688, filed January 13, 1939, entitled: "Upward acting door and removable mullion therefor."

It is frequently desirable to close wide doorways with independent upward acting adjoining closures to avoid use of very large and heavy doors and to make possible an opening of only part of the doorway. This requires doors or closures which extend only partly across the width of the doorway. Such doors or closures must be guided or supported along their adjoining edge portions by means of a stationary vertical mullion, post or stile. These supports or guides, however, are objectionable since they obstruct the doorway when two adjoining closures are open and prevent passage of wide bodies through the doorway.

This invention now provides the required guide or support, hereinafter referred to as a mullion, in a removable form so that the same can be taken out of the doorway when adjoining closures are in open position.

While the invention will hereinafter be specifically described in connection with a pair of adjoining upward acting garage doors, it should be understood that the invention is adapted for use with other types of closures.

According to the invention disclosed in the drawings, a pair of upward acting sectional type garage doors are mounted for vertical and horizontal movement in tracks supporting and guiding rollers extending from the sides of the doors. A metal mullion is removably mounted in vertical position between the doors and extends from the lintel of the doorway to the floor or sill. This mullion is preferably formed by extrusion of an aluminum alloy and is so shaped as to define tracks or guides on both sides thereof for the rollers projecting from the adjoining sides of the doors. The mullion carries resilient weatherstrips adapted to spring against the outer faces of the doors when the same are in closed position to seal any spaces between the doors and the mullion.

The bottom of the mullion is removably mounted in a fixed floor plate while the top of the mullion is readily latched into aligned position with the fixed tracks of the assembly.

It is, then, an object of this invention to provide a removable mullion for adjoining closures.

Another object of the invention is to provide an extruded aluminum alloy removable mullion for closures.

A specific object of the invention is to provide a removable mullion for upward acting doors adapted to be quickly and easily latched into operative position for guiding and supporting the adjacent edges of a pair of doors as the doors are moved to a closed position.

A further specific object of this invention is to provide a one-piece light-weight removable mullion for upward acting doors having track portions for receiving and guiding the door rollers and also having a transverse wall bridging the space between the adjoining edges of the doors and carrying weatherstrips for coacting with the outer faces of the doors to seal said space.

A further object of the invention is to provide a removable mullion for upward acting doors adapted to be seated at its bottom end in a socket plate secured in the doorway and tilted normally to the doorway into and out of operative vertical position between the top and bottom of the doorway.

Other and further objects of the invention will become apparent to those skilled in the art from the following detailed description of the annexed sheets of drawings which disclose a preferred embodiment of the invention.

On the drawings:

Figure 1 is a fragmentary elevational view of a doorway viewed from the inside thereof and having upward acting doors mounted therein in closed position with a removable mullion, according to this invention, bridging the space between the adjoining edges of the doors.

Figure 2 is a broken fragmentary elevational view similar to Figure 1 but illustrating the doors in opened position and with the mullion removed from the doorway.

Figure 3 is an enlarged vertical cross-sectional view, with parts in elevation, taken along the line III—III of Figure 1.

Figure 4 is an enlarged fragmentary horizontal cross-sectional view with parts in elevation taken along the line IV—IV of Figure 1.

Figure 5 is an enlarged horizontal cross-sectional view, with parts omitted, taken along the line V—V of Figure 1.

Figure 6 is an enlarged fragmentary elevational view taken along the line VI—VI of Figure 3.

Figure 7 is an enlarged fragmentary vertical cross-sectional view, with parts in elevation, taken along the line VII—VII of Figure 1.

Figure 8 is a fragmentary vertical cross-sectional view, with parts in elevation, taken along the line VIII—VIII of Figure 7.

Figure 9 is an enlarged broken elevational view of the removable mullion.

Figure 10 is a top plan view of the mullion.

As shown on the drawings:

In Figures 1 and 2, the reference numeral 10 designates a doorway defined by side door jambs 11 and 12, by a lintel 13 extending between the tops of the door jambs and by a floor 14 extending between the bottoms of the door jambs.

A roof or ceiling 13*a* extends inwardly from the doorway 10 at a level above the bottom of the lintel 13.

The doorway 10 is closed by a pair of doors A and B, mounted on rollers for horizontal movement below the ceiling or roof 13*a* and for vertical movement into the doorway. The doors A and B are of the horizontal sectional type with the door A composed of hinged-together sections *a*, a^1, a^2, a^3, and a^4 and the door B composed of hinged-together sections *b*, b^1, b^2, b^3 and b^4.

A vertical track 15 is secured to each side jamb 11 and 12 with the open faces of the tracks facing the doorway 10. Curved track sections 16 communicate with the tops of the track 15 and with horizontal tracks 17 extending inwardly from the doorway. The curved tracks 16 and the adjoining ends of the horizontal tracks 17 are supported from metal brackets 18 secured to the lintel 13. These brackets 18 also rotatably support pulleys 19.

A floor bracket 20 is fixedly mounted on the floor 14 in the center of the doorway 10. As best shown in Figure 5, the bracket 20 has a wide heel portion 20*a*, a base 20*b* extending forwardly therefrom and toe portions 20*c* defining curved sockets facing the heel portion.

A vertical mullion 21 (Figure 1) has the bottom end thereof mounted in the floor bracket 20. The mullion 21 as best shown in Figures 3 and 4 provides vertical tracks 22 and 23 on each side thereof.

As shown in Figures 3, 4, 9 and 10 the mullion 21 has a web portion 21*a* extending between the tracks 22 and 23 and a transverse outer wall or flange 21*b*. The bottom end of this transverse wall 21*b* abuts the heel 20*a* of the floor bracket 20 while the tracks 22 and 23 abut the curved sockets provided by the toes 20*c* of the bracket 20 as shown in Figure 5. Legs 21*c* and 21*d* extend from opposite sides of the web 21*a* between the back wall 21*b* and the tracks 22 and 23. These legs cooperate with the tracks to hold the door rollers therein as best shown in Figure 4.

As shown in Figures 1, 2 and 3, angle plates 24 are secured to the inner face of the lintel 13 above the floor bracket 20. These angle plates 24 have inwardly extending flanges 25 in abutting relation, each carrying a curved track section 26 and 27. The curved track 26 communicates with the track 22 of the mullion 21 while the curved track 27 communicates with the track 23 of the mullion 21.

Horizontal tracks 28 and 29 extend inwardly from the upper ends of the curved track sections 26 and 27 respectively.

As best shown in Figure 3, the inner ends of the horizontal tracks, such as the inner end of the track 28, are carried on a transverse support 30 suspended from the ceiling or roof 13*a*. This transverse support 30 extends across the entire width of the doorway so as to also carry the inner ends of the horizontal tracks 17. Counterbalancing spring actuated pulleys such as 31 are rotatably mounted in the support 30 in alignment with the pulleys 19 and with pulleys 32 and 33 rotatably carried by the flanges 25 of the angle plates 24. Separate cables such as 34 are adapted to be wound around the spring actuated pulleys such as 31, are trained over the pulleys 19, 32 and 33 aligned with the actuated pulleys and are secured at their other ends to the bottom door sections *a* and *b*.

As best shown in Figures 3, 7 and 8, the top of the mullion 21 fits under the lower ends of the curved tracks 26 and 27. A bracket 35 is bolted to the bottom of the lintel 13 to abut the top portion of the back wall 21*b* of the mullion as also shown in Figure 4.

The web 21*a* of the mullion 21 has a U-shaped plate 36 extending above the top thereof. Legs 37 of the plate fit over the sides of the web and are riveted thereto by rivets 38.

The plate 36 extends above the top of the mullion between the legs 21*c* and 21*d* and the tracks 22 and 23 thereof and is adapted to slide between the end portions of the adjoining curved track sections 26 and 27 which extend beneath the flanges 25 of the angle plates 24. These flanges 25 space the track ends to define a slot therebetween for receiving the portion of the plate 36 above the mullion.

A housing 40 for a spring-pressed latch bolt 41 is bolted to a plate 42 carried by the tracks 22 and 23 of the mullion 21 at the top ends of the tracks. The plate 42 can be secured to the tracks as by welding.

As best shown in Figures 3, 7 and 8, the bottoms of the flanges 25 of the angle plates 24 have a tooth defining portion 43 extending downwardly from their inner bottom edges and provided with inwardly sloping edge portions 43*a*. The tooth forms an abutment for the top of the latch bolt 41 to retain the mullion in seated position against the bracket 35 so that the mullion tracks will be in alignment with the curved track sections 26 and 27. The plate 36 holds the mullion against sidewise movement since it is snugly received between the curved track sections.

The latch bolt 41 has an actuating chain 44 projecting from the bottom of the housing 40 as shown in Figures 1, 3 and 9 so that the bolt can be retracted into the housing beneath the tooth to permit an inward tilting of the mullion out of position for removing the same from the doorway.

The mullion is readily inserted into operative position in the doorway by first seating the bottom end thereof into the floor bracket 20 with the tracks 22 and 23 thereof abutting the toes of the floor bracket. The top of the mullion is then swung toward the doorway to position the plate 36 between the curved tracks. The sloping edge 43*a* of the tooth defining portions 43 will automatically retract the latch bolt 41 so that it will pass under the tooth 43 and will then snap into abutting relation against the other edge of the tooth. The latch bolt will thus hold the top end of the mullion against the bracket 35 and will prevent unintentional removal of the mullion.

The top end of the mullion slopes downwardly from the tracks 22 and 23 thereof as shown in Figure 3 in order to facilitate a tilting of the mullion into operative position.

The flanges 25 of the angle plates 24 receive a bolt 50 therethrough as best shown in Figures 3, 7 and 8. The bolt 50 rotatably supports latch members 51 and 52 in alignment with the tracks 26 and 27 respectively. Each latch member 51

and 52 has a hook-like top portion 53 adapted to project into a slot 54 cut in each track 26 and 27. Each latch 51 and 52 also has a downwardly projecting tail portion 55 adapted to be abutted by the plate 42 of the mullion 21.

A spring 56 urges the top portions of both latch members 51 and 52 so that their hook-like ends 53 will extend through the slots 54. The action of the spring, however, is opposed by the plate 42 on the mullion 21 when the mullion is mounted into operating position as shown in Figures 3, 7 and 8. As therein shown the plate 42 abuts the tails 55 of the latches to retract the hook portions 53 from the slots. Whenever the mullion is removed from its operating position these tail portions 55 are released and the spring will move the latches to seat their hook-like ends into the track slots. When seated, these hook-like ends 53 will prevent a closing of the doors A and B, since they will obstruct the passage of the door rollers in the track sections 26 and 27.

This arrangement therefore provides an automatic safety lock preventing a closing of the door when the mullion is removed from the doorway. The safety locks are automatically unlatched when the mullion is mounted in operating position.

As shown in Figures 1 and 3 the door sections of the door A are hinged together by means of hinges 60 secured to the inner faces of adjacent door sections at the edges of the door sections. The sections of the door B are similarly hinged together by means of hinges 61.

Each hinge 60 and 61 can have the pivot pin 62 therefor carry a roller 63 mounted for movement in the tracks as shown in Figure 3.

The top door section a^4 carries an additional set of rollers 64 on axles 65 mounted at the top of the door section along the edges thereof as shown in Figures 1 and 3. The top door section b^4 of the door B carries similar rollers and axles.

When the mullion 21 is mounted in operative position as shown in Figures 1 and 3, the doors A and B can be operated along the vertical, curved, and horizontal tracks to move the door sections between a closed vertical position and an overhead open horizontal position. However, when the mullion is removed as shown in Figure 2, the doors A and B must be in open overhead position since the rollers 63 of the doors in closed position will prevent removal of the mullion. With the doors in their opened overhead position, the mullion can be readily removed as described above. The safety latches or locks then prevent the doors from being closed beyond the position shown in Figure 2 so that the doors can not fall out of their guiding and supporting tracks.

As best shown in Figures 4, 5 and 9 the transverse wall 21*b* of the mullion 21 has longitudinal grooves 70 formed along the inner face thereof near the outer ends of the wall. Resilient metal weather strips 71 are adapted to be snapped into these grooves 70 along the fulll length of the mullion. The weatherstrips 71 have free end portions 72 projecting inwardly from the wall 21*b* into abutting relation with the outer faces of the doors A and B as shown in Figure 4 for sealing any spaces between the outsides of the doors and the mullion. The doors can readily slide relative to the weatherstrips since the strips are resilient and do not interfere with an opening and closing of the doors.

From the above descriptions it should be understood that the mullion constructions of this invention provide many desired advantages in door constructions and present required supports and guides for adjoining upward acting doors. At the same time the mullions of this invention act as seals between adjoining doors or closures.

The mullions can be made of light-weight material such as aluminum alloy and can be produced at reasonable cost by an extruding process. Heat-treated extruded aluminum alloy mullions having tensile strengths of 30,000 pounds per square inch are very satisfactory.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. A removable mullion for upward acting closures which comprises an elongated one-piece light weight member having a longitudinal web portion, a transverse wall extending laterally from said web portion along the length thereof, said wall adapted to bridge a space between two adjoining closures, longitudinal grooves in the inner face of said wall on each side of said web portion, longitudinal spring metal weather strips snapped in said grooves and projecting inwardly from said inner face to contact the closures for sealing the space therebetween, curved tracks extending outwardly from said web portion in spaced relation from the transverse wall, and legs extending from said web portion between said tracks and transverse wall to hold rollers in said tracks.

2. A removable mullion for upward acting closures which comprises an elongated one-piece lightweight member having a longitudinal web portion, a transverse wall extending laterally from the web portion along the length thereof, said wall adapted to bridge a space between two adjoining closures and the inner face of said wall having longitudinal grooves on each side of the web portion, at least one longitudinal edge of said grooves having an undercut recess therein, metal weatherstrips snapped into said grooves and held therein by said undercut portion thereof, said weatherstrips projecting inwardly from the inner face of the wall to contact the closures for sealing the space therebetween, and an integral track portion on each side of the web portion in spaced relation from said wall portion adapted to receive and guide rollers projecting from the closures.

3. A mullion construction for spaced adjacent closure members comprising an elongated member, a web portion on said elongated member extending between said closure members, a transverse wall portion extending laterally from each side of said web portion for bridging the space between said closure members and having a longitudinal groove in the inner face thereof on each side of the web, and a weatherstrip snapped in each groove and having a projecting resilient portion for bridging and sealing the space between the transverse wall portion and the adjacent closure member.

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