

SPECIFICATION

Glazed closure assembly

5 The present invention relates to a glazed closure assembly such as a window sash or door, having rails and stiles made of synthetic resin.

There have been known window sashes or doors having frame members such as rails and stiles made of synthetic resin and a pane of glass supported between the frame members with a gasket interposed, the frame members being interconnected by means of screws extending threadedly into them. Such conventional arrangement, however, has proven disadvantageous in that the frame members do not provide enough dimensional stability and rigidity for secure retention of the pane of glass, and the strength of their being assembled together is not sufficiently large because of the screws being tapped into a softer material. Further, the frame members tend to lose a required degree of durability due to creeping.

25 According to the invention, there is provided a glazed closure assembly comprising: a first pair of parallel spaced frame members made of synthetic resin and having a first pair of slots, respectively, facing toward each other; a second pair of parallel spaced frame members made of synthetic resin and having a second pair of slots, respectively, facing toward each other; a pair of parallel spaced attachments made of metal and mounted respectively in said first pair of slots, said attachments having a third pair of slots, respectively, facing toward each other; gasket means disposed in said third pair of slots and said second pair of slots; a pane of glass having its marginal edges supported by said gasket extending therearound; and fastener means connecting said attachments endwise to said second pair of parallel-spaced frame members.

The invention will now be described by way of example with reference to the accompanying drawings, wherein:—

Figure 1 is a vertical cross-sectional view, with a gasket omitted for clarity, of a glazed closure assembly constructed in accordance with the present invention;

Figure 2 is an enlarged cross-sectional view taken along line II-II of Fig. 1;

Figure 3 is a cross-sectional view taken along line III-III of Fig. 1; and

Figure 4 is a cross-sectional view taken along line IV-IV of Fig. 1.

The principles of the present invention are particularly useful when embodied in a glazed closure assembly illustrated in Fig. 1 and generally indicated by the reference numeral 10.

The glazed closure assembly 10 for use as a window sash or door, for example, comprises a frame 11 including a pair of upper and lower horizontal frame members or rails

12, 13 vertically spaced from each other in parallel relationship and a pair of vertical frame members or stiles 14, 15 horizontally spaced from each other in parallel relationship, the rails 12, 13 being connected endwise to the stiles 14, 15. The rails 12, 13 and stiles 14, 15 are made of synthetic resin. A pane of glass 16 is supported in the assembled rails 12, 13 and stiles 14, 15.

70 As shown in Fig. 2, the upper rail 12 is of a substantially H-shaped cross section comprising a pair of spaced sidewalls 17, 18 and a partition 19 extending between the sidewalls 17, 18, there being an opening or slot 20 defined by the sidewalls 17, 18 and partition 19. The sidewalls 17, 18 have a pair of locking projections or ridges 21, 22, respectively, located at inner edges of the sidewalls 17, 18 and extending toward each other into the slot 20. The locking projections 21, 22 have a pair of shoulders 23, 24 facing toward the partition 19.

The lower rail 13 is likewise of a substantially H-shaped cross section comprising a pair of spaced sidewalls 25, 26 and a partition 27 extending between the sidewalls 25, 26, there being an opening or slot 28 defined by the sidewalls 25, 26 and the partition 27 and facing toward the slot 20 in the upper rail 12. The sidewalls 25, 26 have a pair of locking projections or ridges 29, 30, respectively, located at inner edges of the sidewalls 25, 26 and extending toward each other into the slot 28. The locking projections 29, 30 have a pair of shoulders 31, 32 facing toward the partition 27.

A pair of upper and lower elongate attachments 34, 35 of a channel-shaped cross section are vertically spaced from each other and mounted respectively in the slots 20, 28 in the upper and lower rails 12, 13, the attachments 34, 35 having a length substantially equal to that of the rails 12, 13. Each of the attachments 34, 35 is made of a metal such as extruded aluminium. Each attachment 34, 35 has a pair of spaced sidewalls 36, 37 and a bottom wall 38 extending between the sidewalls 36, 37, the sidewalls 36, 37 and bottom wall 38 jointly providing an opening or slot 39. The slot 39 in one of the attachments 34 faces toward the slot 39 in the other attachment 35. Each of the attachments 34, 35 includes a pair of sockets 40, 40 mounted on the bottom wall 38 respectively at the ends of the elongate attachment, as best shown in Fig. 3.

The pair of sidewalls 36, 37 of each attachment 34, 35 have a pair of wedge-shaped projections or ridges 41, 42, respectively, disposed on outer surfaces of the sidewalls 36, 37 and interfitting or interlocking with the shoulders 23, 24 or 31, 32 on the rail sidewalls 17, 18 or 25, 26. The attachment sidewalls 36, 37 further include a pair of locking projections 43, 44 extending toward

each other into the slot 39.

A rubber gasket or sealing member 45 of an elongate length has a pair of recesses 46, 47 opening away from each other and a central slot 48 positioned between the recesses 46, 47. The gasket 45 extends around or surrounds the pane of glass 16 with its marginal edges disposed in the central slot 48 of the gasket 45 so as to be supported thereby. The locking projections 43, 44 on the attachment sidewalls 36, 38 are received respectively in the recesses 46, 47 in the gasket 45.

The lower rail 13 has a channel 49 opening downwardly and receiving rollers 50 rotatably supported on the lower rail 13 for rolling engagement with a rail (not shown) mounted on a sill.

Each stile 14, 15 of Fig. 3 includes a pair of spaced central walls 51, 52 and a pair of sidewalls 53, 54 interconnected by a partition 55 extending therebetween, the central walls 51, 52 being connected to the partition 55. The sidewalls 53, 54 and the partition 55 jointly define an opening or slot 56 in which the gasket 45 is disposed, as shown in Fig. 4. The partition 55 has apertures 57 which are aligned with apertures 59 in a partition 58 extending between the central walls 51, 52.

Self-tapping screws 60 extend through the apertures 57 threadedly into the sockets 40.

As shown in Fig. 4, the sidewalls 53, 54 of each stile 14, 15 have a pair of locking projections or ridges 61, 62 extending toward each other into the slot 56 and received respectively in the recesses 46, 47 in the gasket 45.

The glazed closure assembly 10 is assembled as follows: The upper and lower attachments 34, 35 are inserted into the slots 20, 28 in the upper and lower rails 12, 13, respectively, until the wedge shaped locking projections 41, 42 on the attachments 34, 35 move past the locking projections 21, 22 and 29, 30 on the upper and lower rails 12, 13 and snappingly engage the shoulders 23, 24 and 31, 32 of the locking projections 21, 22 and 29, 30, respectively. Then, the gasket 45 disposed around the periphery of the glass pane 16 is forced into the slots 39, 39 in the attachments 34, 35 until the locking projections 43, 44 are placed in the recesses 46, 47 in the gasket 45. The stiles 14, 15 are fitted over the ends of the upper and lower rails 12, 13 with the gasket 45 pushed into the slots 56 in the stiles 14, 15. After the locking projections 61, 62 on the stiles 14, 15 are received in the recesses 46, 47 in the gasket 45, the screws 60 are put through the apertures 59, 57 in the stiles 14, 15 and threaded into the sockets 40 of the attachments 34, 35.

With this arrangement, the glass pane 16 is stably supported by the metal attachments 34, 35, and the entire glazed closure assem-

bly 10 is of a rugged structure because the screws 60 threadedly engage the metal attachments 34, 35 in attaching the stiles 14, 15 to the upper and lower rails 12, 13.

Instead of placing the attachments 34, 35 in the rails 12, 13, they may be mounted in the stiles 14, 15.

CLAIMS

1. A glazed closure assembly comprising: a first pair of parallel spaced frame members made of synthetic resin and having a first pair of slots, respectively, facing toward each other; a second pair of parallel spaced frame members made of synthetic resin and having a second pair of slots, respectively, facing toward each other; a pair of parallel spaced attachments made of metal and mounted respectively in said first pair of slots, said attachments having a third pair of slots, respectively, facing toward each other; gasket means disposed in said third pair of slots and said second pair of slots; a pane of glass having its marginal edges supported by said gasket extending therearound; and fastener means connecting said attachments endwise to said second pair of parallel spaced frame members.

2. A glazed closure assembly according to claim 1, each of said first pair of frame members having a pair of first locking projections extending toward each other into one of said first pair of slots, each of said attachments having a pair of second locking projections extending away from each other and interfitting with said first locking projections.

3. A glazed closure assembly according to claim 1, each of said attachments having a pair of locking projections extending toward each other into one of said third pair of slots, said gasket having a pair of recesses opening away from each other and receiving therein said locking projections, respectively.

4. A glazed closure assembly according to claim 1, each of said pair of attachments comprising an elongate channel-shaped structure having a length substantially equal to that of one of said first pair of frame members, said channel-shaped structure including a pair of sidewalls, a bottom wall extending between said sidewalls, and a pair of sockets mounted on said bottom wall respectively at the ends of said elongate structure and receiving said fastener means.

5. A glazed closure assembly substantially as herein described with reference to and as illustrated in the accompanying drawings.

each other into the slot 39.

A rubber gasket or sealing member 45 of an elongate length has a pair of recesses 46, 47 opening away from each other and a central slot 48 positioned between the recesses 46, 47. The gasket 45 extends around or surrounds the pane of glass 16 with its marginal edges disposed in the central slot 48 of the gasket 45 so as to be supported thereby. The locking projections 43, 44 on the attachment sidewalls 36, 38 are received respectively in the recesses 46, 47 in the gasket 45.

The lower rail 13 has a channel 49 opening downwardly and receiving rollers 50 rotatably supported on the lower rail 13 for rolling engagement with a rail (not shown) mounted on a sill.

Each stile 14, 15 of Fig. 3 includes a pair of spaced central walls 51, 52 and a pair of sidewalls 53, 54 interconnected by a partition 55 extending therebetween, the central walls 51, 52 being connected to the partition 55. The sidewalls 53, 54 and the partition 55 jointly define an opening or slot 56 in which the gasket 45 is disposed, as shown in Fig. 4. The partition 55 has apertures 57 which are aligned with apertures 59 in a partition 58 extending between the central walls 51, 52.

Self-tapping screws 60 extend through the apertures 57 threadedly into the sockets 40.

As shown in Fig. 4, the sidewalls 53, 54 of each stile 14, 15 have a pair of locking projections or ridges 61, 62 extending toward each other into the slot 56 and received respectively in the recesses 46, 47 in the gasket 45.

The glazed closure assembly 10 is assembled as follows: The upper and lower attachments 34, 35 are inserted into the slots 20, 28 in the upper and lower rails 12, 13, respectively, until the wedge shaped locking projections 41, 42 on the attachments 34, 35 move past the locking projections 21, 22 and 29, 30 on the upper and lower rails 12, 13 and snappingly engage the shoulders 23, 24 and 31, 32 of the locking projections 21, 22 and 29, 30, respectively. Then, the gasket 45 disposed around the periphery of the glass pane 16 is forced into the slots 39, 39 in the attachments 34, 35 until the locking projections 43, 44 are placed in the recesses 46, 47 in the gasket 45. The stiles 14, 15 are fitted over the ends of the upper and lower rails 12, 13 with the gasket 45 pushed into the slots 56 in the stiles 14, 15. After the locking projections 61, 62 on the stiles 14, 15 are received in the recesses 46, 47 in the gasket 45, the screws 60 are put through the apertures 59, 57 in the stiles 14, 15 and threaded into the sockets 40 of the attachments 34, 35.

With this arrangement, the glass pane 16 is stably supported by the metal attachments 34, 35, and the entire glazed closure assembly

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2. A glazed closure assembly according to claim 1, each of said first pair of frame members having a pair of first locking projections extending toward each other into one of said first pair of slots, each of said attachments having a pair of second locking projections extending away from each other and interfitting with said first locking projections.

3. A glazed closure assembly according to claim 1, each of said attachments having a pair of locking projections extending toward each other into one of said third pair of slots, said gasket having a pair of recesses opening away from each other and receiving therein said locking projections, respectively.

4. A glazed closure assembly according to claim 1, each of said pair of attachments comprising an elongate channel-shaped structure having a length substantially equal to that of one of said first pair of frame members, said channel-shaped structure including a pair of sidewalls, a bottom wall extending between said sidewalls, and a pair of sockets mounted on said bottom wall respectively at the ends of said elongate structure and receiving said fastener means.

5. A glazed closure assembly substantially as herein described with reference to and as illustrated in the accompanying drawings.

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