

SPECIFICATION Butt Joint Structure

Description

This invention relates in its broader aspects to sliding shutters placed outside an ordinary window as to shut out the light, obstruct the view or passage, or protect against severe weather, and to a shutter box mounted on either side of the window for receiving and holding the sliding shutters when they are opened. More specifically, the invention deals with improvements in a butt joint between frame members such as the sill track for the sliding shutters and the sill of the shutter box.

A sliding-shutter sill track and a shutter-box sill have heretofore been butt-jointed usually by use of a connector strip placed across and under the junction between their horizontal bottom walls. The connector strip has tapped holes formed therein for receiving and engaging countersunk screws passing through holes formed in the bottom walls.

An objection to this conventional butt-joint structure is that it necessitates such time-consuming steps of assemblage as the creation of the tapped holes in the connector strip and that of the countersunk holes in the bottom walls of the sliding-shutter sill track and the shutter-box sill. Another objection is that when loosened with the lapse of time, the screws rise from within the countersunk holes thereby preventing the smooth sliding movement of the shutters into and out of the shutter box.

According to a first aspect of the invention, there is provided a butt-joint structure comprising: a first elongate frame member including a first bottom wall; means on the underside of the first bottom wall defining a first fastener-receiving hole extending longitudinally of said first frame member; a second elongate frame member including a second bottom wall disposed in coplanar relationship to the first bottom wall; means on the underside of the second bottom wall defining a second fastener-receiving hole extending longitudinally of said second frame member, the first and the second fastener-receiving holes being disposed in offset relationship to each other; and a connector having formed therein third and fourth fastener-receiving holes in alignment with the first and the second fastener-receiving holes, respectively; said first and second frame members being butt-jointed via the connector by a threaded fastener element passing through the third fastener-receiving hole and threadedly engaged in the first fastener-receiving hole and by another threaded fastener element passing through the fourth fastener-receiving hole and threadedly engaged in the second fastener-receiving hole; the connector connecting the first and second bottom walls in longitudinally coplanar relationship to each other; wherein the connector comprises a base portion having the third and the fourth fastener-receiving holes formed therein, and an upstanding portion on the

interiorly directed end of the base portion, the connector being at least partly caught between the first and second frame members.

According to a second aspect of the invention, there is provided a butt-joint structure comprising: a sliding-shutter sill track including a first horizontal bottom wall; means on the underside of the first bottom wall defining a first fastener-receiving hole extending longitudinally of the sliding-shutter sill track; a shutter-box sill including a second horizontal bottom wall disposed in coplanar relationship to the first bottom wall; means on the underside of the second bottom wall defining a second fastener-receiving hole extending longitudinally of the shutter-box sill, the first and the second fastener-receiving holes being disposed in offset relationship to each other; and a connector having formed therein third and fourth fastener-receiving holes in alignment with the first and the second fastener-receiving holes, respectively; the sliding-shutter sill track and the shutter-box sill being butt-jointed via the connector by a threaded fastener element passing through the third fastener-receiving hole and threadedly engaged in the first fastener-receiving hole and by another threaded fastener element passing through the fourth fastener-receiving hole and threadedly engaged in the second fastener-receiving hole; the connector connecting the first and second bottom walls in longitudinally coplanar relationship to each other; wherein the connector comprises a base portion having the third and the fourth fastener-receiving holes formed therein, and an upstanding portion on the interiorly directed end of the base portion, the connector being at least partly caught between the sliding-shutter sill track and the shutter-box sill.

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

Figure 1 is a fragmentary, exploded perspective view of a preferred form of the butt-joint structure between sliding-shutter sill track and shutter-box sill in accordance with this invention;

Figure 2 is a fragmentary perspective view showing the butt-joint structure of Figure 1 in assembled form; and

Figure 3 is a fragmentary plan view, partly broken away and partly sectioned for clarity, also showing the butt-joint structure of Figure 1 in assembled form.

The present invention is particularly useful when embodied in a window-frame and shutter-box assembly as shown in Figures 1 to 3 inclusive. However, the invention is also applicable to an assembly of frame members such as for doors or windows.

The above drawings show a window frame including a sill 10 and a side jamb 11, a shutter-box sill 12, and a connector 13. The window frame is intended to receive and hold horizontally moving, lapping window sashes, not shown, and its sill 10 has parallel tracks 14 for such sashes. Also formed by the window-frame sill 10 is an

additional track 15 for sliding shutters, not shown, that extends along the window sash sill tracks 14. The present invention particularly concerns the butt joint formed between the sliding-shutter sill track 15 and the shutter-box sill 12 with the use of the connector 13.

In the following description and in the claims appended hereto, the terms "exterior" and "interior" are intended to refer to the directions toward the outside and toward the inside, respectively, of the window in planes normal to the window plane. Thus, for example, the sliding-shutter sill track 15 can be described as being disposed exteriorly of the window-sash sill tracks 14.

With reference to Figure 1 in particular, the sliding-shutter sill track 15 is in the form of an open channel including a horizontal bottom wall 16, and exterior 17 and interior 18 upstanding flanges formed on and along the exterior and interior edges, respectively, of the bottom wall. The interior flange 18 is provided with an overhanging ledge 19 projecting exteriorly therefrom and terminating in a downturned flange 20 of comparatively short extent. The exterior flange 17 has a recess 21 formed in the lower corner of its end placed opposite to the shutter-box sill 12. This recess 21 is intended to engage the connector 13, as will be detailed subsequently.

Formed integrally on the underside of the sliding-shutter sill track bottom wall 16 are a pair of oppositely curved ribs 22 extending longitudinally of the track. The pair of ribs 22 coact to define a screw hole 23 therebetween, for receiving and threadedly engaging a slotted-headed screw 24.

Two other similar screw holes 25 and 26 are shown to be defined under the window-frame sill 10, for receiving and threadedly engaging slotted-headed screws 27 and 28, respectively. These screws 27 and 28 pass through respective holes 29 and 30 in the window-frame jamb 11. The window-frame sill 10 and jamb 11 are thus conventionally screwed together, with a sealing sheet 31 interposed therebetween. The window-frame jamb 11 has a recess 32 formed in the lower end of its exterior edge for engaging the connector 13, as will also be detailed presently.

The shutter-box sill 12 is in the form of an open channel including a horizontal bottom wall 33 of considerably greater width than the sliding-shutter sill track bottom wall 16, and exterior 34 and interior 35 upstanding flanges formed on and along the exterior and interior edges, respectively, of the bottom wall. The interior flange 35, which is of the same height as the sliding-shutter sill track interior flange 18, is provided with an overhanging ledge 36 projecting both exteriorly and interiorly from the top edge of the interior flange. That portion of this overhanging ledge 36 which projects exteriorly from the interior flange 35 is also of the same width as the sliding-shutter sill track ledge 19.

The overhanging ledge 36 is provided with a

downturned flange 37, similar to the sliding-shutter sill track flange 20, on and along its exterior edge and with an upturned flange 38 on and along its interior edge. The flange 38 has an angled portion 39.

On the underside of the shutter-box sill bottom wall 33 there are integrally formed a pair of oppositely curved ribs 40 extending longitudinally of the sill and disposed in transversely offset relationship to the rib pair 22 on the underside of the sliding-shutter sill track bottom wall 16. The paired ribs 40 also coact to define a screw hole 41 therebetween, for receiving and threadedly engaging a slotted-headed screw 42.

Another similar screw hole 43 is shown to be formed along and interiorly of the junction between the upturned flange 38 and the angled portion 39 of the shutter-box sill 12. This screw hole 43 is intended to receive and threadedly engage a slotted-headed screw 44 passing through a hole 45 in the window-frame jamb 11. The window-frame jamb 11 and the shutter-box sill 12 are thus screwed together, with a sealing sheet 46 interposed therebetween.

Essentially, the connector 13 is of L-shaped construction comprising a comparatively thin base portion 47 extending transversely of the plane of the window frame, and an upstanding portion 48 on the interiorly directed end of the base portion. The connector base portion 47 has a length equal to the width of the shutter-box sill bottom wall 33. The height of the connector upstanding portion 48 is such that its top edge is disposed flush with the top surfaces of the sliding-shutter sill track ledge 19 and the shutter-box sill ledge 36. The length of the connector upstanding portion 48 in the transverse direction of the window-frame plane is equal to the width of the sliding-shutter sill track ledge 19.

The connector base portion 47 has formed therein two screw holes 49 and 50 so as to be in alignment with the above noted screw holes 23 and 41, respectively, on the undersides of the sliding-shutter sill track bottom wall 16 and the shutter-box sill bottom wall 33. These screw holes 49 and 50 are of course intended to permit the passage therethrough of the screws 24 and 42 as they are driven into the screw holes 23 and 41, respectively. The connector base 47 and upstanding 48 portions are mostly caught between the sliding-shutter sill track 15 and the shutter-box sill 12.

On the opposite sides of the connector base portion 47 there are formed a pair of identical wings 51 and 51' comprising exterior portions 52 and 52' and interior portions 53 and 53', respectively. The exterior wing portions 52 and 52' are shown to be less in width than the interior wing portions 53 and 53'. The paired wings 51 and 51' have aligned grooves formed at 54 and 55 for the passage of the screws 24 and 42 into and through the screw holes 49 and 50 in the connector base portion 47.

The interior wing portion 53 of the connector 13 is placed under the sliding-shutter sill track

bottom wall 16, with the exterior wing portion 52 engaged in the recess 21 in the sliding-shutter sill track exterior flange 17. The exterior 52' and interior 53' wing portions on the other side of the connector base portion 47 are placed wholly under the shutter-box sill bottom wall 33.

The connector upstanding portion 48 also has a pair of identical wings 56 and 56' formed on its opposite sides. The wing 56 is held against the bottom wall 16, interior flange 18 and overhanging ledge 19 of the sliding-shutter sill track 15. The other wing 56' is held against the bottom wall 33, interior flange 35 and overhanging ledge 36 of the shutter-box sill 12.

For assemblage, as will be seen also from Figures 2 and 3, the connector 13 may first be fastened to the sliding-shutter sill track 15 by the screw 24 passing through the hole 49 in the connector base portion 47 and threadedly engaged in the hole 23 on the underside of the sliding-shutter sill track bottom wall 16. The window frame sill 10 and side jamb 11 are then fastened together by the screws 27 and 28 passing through the holes 29 and 30 in the jamb and threadedly engaged in the holes 25 and 26 under the sill. The connector upstanding portion 48 is now engaged in the recess 32 in the window-frame jamb 11.

The shutter-box sill 12 is then fastened to the window-frame jamb 11 by the screw 44 passing through the hole 45 in the jamb and threadedly engaged in the hole 43 in the shutter-box sill. Finally, the shutter-box sill 12 is fastened to the sliding-shutter sill track 15 through the connector 13 by the screw 42 passing through the hole 50 in the connector base portion 47 and threadedly engaged in the hole 41 on the underside of the shutter-box sill bottom wall 33.

An additional advantage of the butt-joint structure of the present invention is that the bottom walls 16 and 33 are coupled tightly together since the bottom wall 16 is fastened to the connector 13 by the screw 24 and the bottom wall 33 is fastened to the connector 13 by the screw 42, the screws 24 and 42 extending in opposite directions.

Although the illustrated connector is shown to have a pair of wings on the opposite sides of each of its base and upstanding portions, only one such wing may be formed on either side of the base or upstanding portion. The illustrated symmetrical construction is preferred, however, so as to be able to put the connector to use regardless of whether the shutter-box sill is located on the right or left side of the sliding-shutter sill track.

Claims

1. A butt-joint structure comprising: a first elongate frame member including a first bottom wall; means on the underside of the first bottom wall defining a first fastener-receiving hole extending longitudinally of said first frame member; a second elongate frame member including a second bottom wall disposed in coplanar relationship to the first bottom wall;

means on the underside of the second bottom wall defining a second fastener-receiving hole extending longitudinally of said second frame member, the first and the second fastener-receiving holes being disposed in offset relationship to each other; and a connector having formed therein third and fourth fastener-receiving holes in alignment with the first and the second fastener-receiving holes, respectively; said first and second frame members being butt-jointed via the connector by a threaded fastener element passing through the third fastener-receiving hole and threadedly engaged in the first fastener-receiving hole and by another threaded fastener element passing through the fourth fastener-receiving hole and threadedly engaged in the second fastener-receiving hole; the connector connecting the first and second bottom walls in longitudinally coplanar relationship to each other; wherein the connector comprises a base portion having the third and the fourth fastener-receiving holes formed therein, and an upstanding portion on the interiorly directed end of the base portion, the connector being at least partly caught between the first and second frame members.

2. A butt-joint structure comprising: a sliding-shutter sill track including a first horizontal bottom wall; means on the underside of the first bottom wall defining a first fastener-receiving hole extending longitudinally of the sliding shutter sill track; a shutter-box sill including a second horizontal bottom wall disposed in coplanar relationship to the first bottom wall; means on the underside of the second bottom wall defining a second fastener-receiving hole extending longitudinally of the shutter-box sill, the first and the second fastener-receiving holes being disposed in offset relationship to each other; and a connector having formed therein third and fourth fastener-receiving holes in alignment with the first and the second fastener-receiving holes, respectively; the sliding-shutter sill track and the shutter-box sill being butt-jointed via the connector by a threaded fastener element passing through the third fastener-receiving hole and threadedly engaged in the first fastener-receiving hole and by another threaded fastener element passing through the fourth fastener-receiving hole and threadedly engaged in the second fastener-receiving hole; the connector connecting the first and second bottom walls in longitudinally coplanar relationship to each other; wherein the connector comprises a base portion having the third and the fourth fastener-receiving holes formed therein, and an upstanding portion on the interiorly directed end of the base portion, the connector being at least partly caught between the sliding-shutter sill track and the shutter-box sill.

3. A butt-joint structure according to claim 1 or 2, wherein the base portion of the connector is formed to include at least one wing projecting from either side thereof in underlying relationship to the first or the second horizontal bottom wall.

4. A butt-joint structure according to claim 3,



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bottom wall 16, with the exterior wing portion 52 engaged in the recess 21 in the sliding-shutter sill track exterior flange 17. The exterior 52' and interior 53' wing portions on the other side of the connector base portion 47 are placed wholly under the shutter-box sill bottom wall 33.

The connector upstanding portion 48 also has a pair of identical wings 56 and 56' formed on its opposite sides. The wing 56 is held against the bottom wall 16, interior flange 18 and overhanging ledge 19 of the sliding-shutter sill track 15. The other wing 56' is held against the bottom wall 33, interior flange 35 and overhanging ledge 36 of the shutter-box sill 12.

For assemblage, as will be seen also from Figures 2 and 3, the connector 13 may first be fastened to the sliding-shutter sill track 15 by the screw 24 passing through the hole 49 in the connector base portion 47 and threadedly engaged in the hole 23 on the underside of the sliding-shutter sill track bottom wall 16. The window frame sill 10 and side jamb 11 are then fastened together by the screws 27 and 28 passing through the holes 29 and 30 in the jamb and threadedly engaged in the holes 25 and 26 under the sill. The connector upstanding portion 48 is now engaged in the recess 32 in the window-frame jamb 11.

The shutter-box sill 12 is then fastened to the window-frame jamb 11 by the screw 44 passing through the hole 45 in the jamb and threadedly engaged in the hole 43 in the shutter-box sill. Finally, the shutter-box sill 12 is fastened to the sliding-shutter sill track 15 through the connector 13 by the screw 42 passing through the hole 50 in the connector base portion 47 and threadedly engaged in the hole 41 on the underside of the shutter-box sill bottom wall 33.

An additional advantage of the butt-joint structure of the present invention is that the bottom walls 16 and 33 are coupled tightly together since the bottom wall 16 is fastened to the connector 13 by the screw 24 and the bottom wall 33 is fastened to the connector 13 by the screw 42, the screws 24 and 42 extending in opposite directions.

Although the illustrated connector is shown to have a pair of wings on the opposite sides of each of its base and upstanding portions, only one such wing may be formed on either side of the base or upstanding portion. The illustrated symmetrical construction is preferred, however, so as to be able to put the connector to use regardless of whether the shutter-box sill is located on the right or left side of the sliding-shutter sill track.

Claims

1. A butt-joint structure comprising: a first elongate frame member including a first bottom wall; means on the underside of the first bottom wall defining a first fastener-receiving hole extending longitudinally of said first frame member; a second elongate frame member including a second bottom wall disposed in coplanar relationship to the first bottom wall;

means on the underside of the second bottom wall defining a second fastener-receiving hole extending longitudinally of said second frame member, the first and the second fastener-receiving holes being disposed in offset relationship to each other; and a connector having formed therein third and fourth fastener-receiving holes in alignment with the first and the second fastener-receiving holes, respectively; said first and second frame members being butt-jointed via the connector by a threaded fastener element passing through the third fastener-receiving hole and threadedly engaged in the first fastener-receiving hole and by another threaded fastener element passing through the fourth fastener-receiving hole and threadedly engaged in the second fastener-receiving hole; the connector connecting the first and second bottom walls in longitudinally coplanar relationship to each other; wherein the connector comprises a base portion having the third and the fourth fastener-receiving holes formed therein, and an upstanding portion on the interiorly directed end of the base portion, the connector being at least partly caught between the first and second frame members.

2. A butt-joint structure comprising: a sliding-shutter sill track including a first horizontal bottom wall; means on the underside of the first bottom wall defining a first fastener-receiving hole extending longitudinally of the sliding shutter sill track; a shutter-box sill including a second horizontal bottom wall disposed in coplanar relationship to the first bottom wall; means on the underside of the second bottom wall defining a second fastener-receiving hole extending longitudinally of the shutter-box sill, the first and the second fastener-receiving holes being disposed in offset relationship to each other; and a connector having formed therein third and fourth fastener-receiving holes in alignment with the first and the second fastener-receiving holes, respectively; the sliding-shutter sill track and the shutter-box sill being butt-jointed via the connector by a threaded fastener element passing through the third fastener-receiving hole and threadedly engaged in the first fastener-receiving hole and by another threaded fastener element passing through the fourth fastener-receiving hole and threadedly engaged in the second fastener-receiving hole; the connector connecting the first and second bottom walls in longitudinally coplanar relationship to each other; wherein the connector comprises a base portion having the third and the fourth fastener-receiving holes formed therein, and an upstanding portion on the interiorly directed end of the base portion, the connector being at least partly caught between the sliding-shutter sill track and the shutter-box sill.

3. A butt-joint structure according to claim 1 or 2, wherein the base portion of the connector is formed to include at least one wing projecting from either side thereof in underlying relationship to the first or the second horizontal bottom wall.

4. A butt-joint structure according to claim 3,



wherein the wing has grooves formed therein for the passage of the threaded fastener elements into and through the third and the fourth fastener-receiving holes.

5 5. A butt-joint structure according to claim 3 or 4, wherein the base portion of the connector has another wing projecting from the other side thereof, the two wings on the opposite sides of the base portion being symmetrical.

10 6. A butt-joint structure according to any one of claims 1 to 4, wherein the first frame member/sliding-shutter sill track and the second frame member/shutter-box sill further include first and second interior flanges extending upwardly

15 from the first and the second bottom walls and provided with first and second over-hanging ledges, respectively, and wherein the upstanding portion of the connector is formed to include at least one wing projecting from either side thereof and held against the first or the second bottom wall, the first or the second interior flange, and the first or the second overhanging ledge.

20 7. A butt-joint structure according to claim 6, wherein the upstanding portion of the connector has another wing projecting from the other side thereof, the two wings on the opposite sides of the upstanding portion being symmetrical.