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SASH CONSTRUCTION FOR A SLIDING WINDOW

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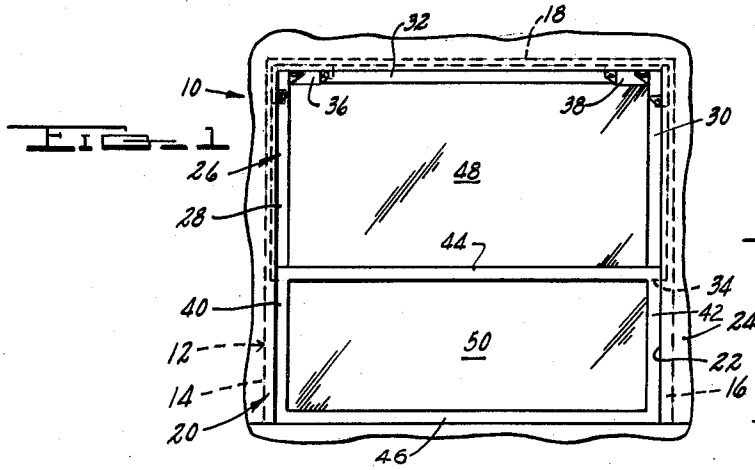


Fig. 1

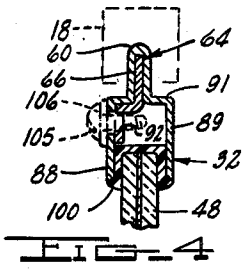


Fig. 4

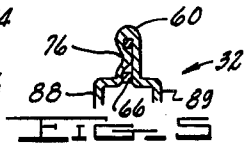


Fig. 5

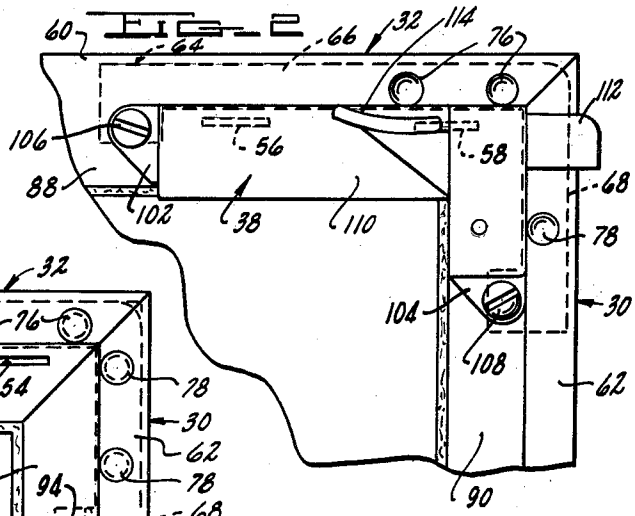


Fig. 2

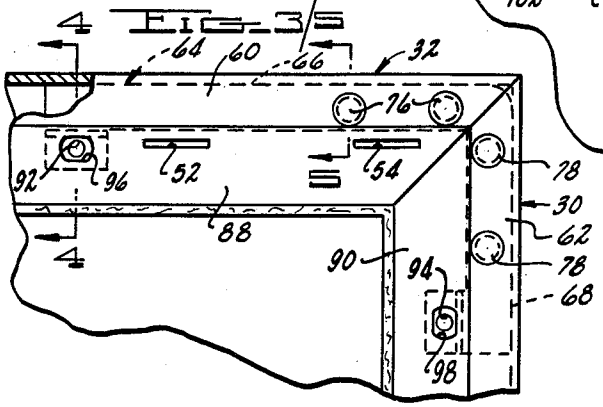


Fig. 3

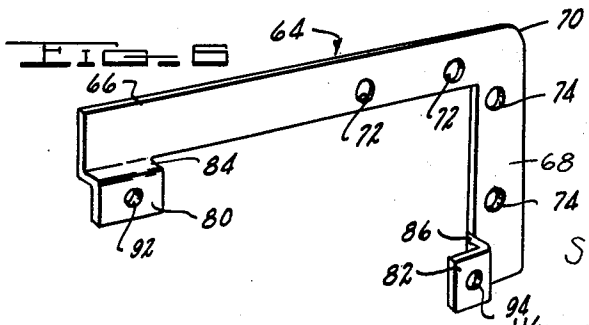


Fig. 6

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SASH CONSTRUCTION FOR A SLIDING WINDOW

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This invention relates to a sash for a sliding window construction, and more particularly to a sliding window sash construction having a corner bracket structure provided in the sash for joining and reinforcing the sash elements and for mounting a lock on the sash.

Sliding windows such as presently referred to are of the type used in buses and like vehicles. Such windows ordinarily have two separate sash members, one of which is slidable to an open position to permit ventilation of the interior of the vehicle. Locks are provided on the stiles of the slidable sash to cooperate with lock racks provided in the window jambs to permit positioning of the sash at the desired open position. The sash is fixed in the desired position by engagement of the lock catches with a pair of projections provided on the lock rack.

In recent years, aluminum and aluminum alloys have gained acceptance with some vehicle manufacturers for for the fabrication of some of the vehicle components, including sliding windows. The reasons for the use of aluminum reside in the well-known desirable properties of aluminum, such as corrosion resistance. However, aluminum has some deficiencies when compared with a harder metal such as steel and these deficiencies have made aluminum somewhat difficult to incorporate into sliding window designs. For one thing, aluminum is relatively soft. It is consequently impractical to use self-threading screws with thin walled aluminum structural members. Self-threading screws have in the past been used as a convenient method of attaching the locks to the sash of a sliding window.

Conventionally, the sash includes channel members to form the side stiles and top rail. The glass is mounted within the channel, forming an enclosed space in the stiles and top rail structure. In the past, when aluminum has been used, the window locks have been mounted on the sash by providing a nut within the enclosed space formed by the sash members. The nut has been engaged by a bolt or screw to attach the lock thereto. After the lock has been mounted, the window element has then been inserted to complete the structure. When the window lock is taken off for repairs or for some other reason, the nut will of course be separated from the screw and it has been necessary to disassemble the entire window in order to retrieve the nut and again secure the lock to the sash.

In addition to the above problem, aluminum does not have the strength characteristics of steel, and it is desirable in some way to reinforce the aluminum sash structure, particularly at the corners to prevent deformation in use.

The above problems are solved by the present invention by the provision of a novel corner bracket structure for the sash which permits the use of self-threading screws to mount the locks and also acts to join and reinforce the corner portions of the sash.

It is an object of the invention to provide an improved sliding window sash construction for buses and like vehicles.

A further object of the invention is to provide an improved sash structure which may incorporate aluminum or other soft metal structural components.

Another object of the invention is to provide a corner bracket structure for the window sash which will permit

the mounting of window locks on the sash by the use of self-threading screws.

A still further object of the invention is to provide such a corner bracket construction which will serve to reinforce and join the corners of the sash.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

In the drawings:

FIGURE 1 is a front elevational view of a slidable window construction mounted in a window opening and forming one embodiment of the present invention;

FIGURE 2 is an enlarged view of the upper right hand corner of the upper sash of the FIGURE 1 embodiment;

FIGURE 3 is a view similar to FIGURE 2 with the lock removed for the purpose of clarity;

FIGURE 4 is a sectional view taken substantially along the line 4—4 of FIGURE 3 looking in the direction of the arrows illustrating the cooperative relationship between the top rail and the corner bracket of this invention;

FIGURE 5 is a sectional view taken substantially along the line 5—5 of FIGURE 3 looking in the direction of the arrows illustrating the method of attachment of the corner bracket to the window sash;

FIGURE 6 is a perspective view of the corner bracket of the present invention.

Before explaining the present invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also, it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Referring to FIGURE 1, it may be seen that the slidable window construction **10** comprises a generally rectangular window frame **12** having left and right jambs **14, 16** connected together at their upper and lower ends by, respectively, a header **18** and a sash **20**. The frame **12** is mounted in an opening **22** provided in vehicle body structrue **24**.

Mounted in the frame **12** are a pair of generally rectangular sashes **20, 26**. The upper sash **26** is vertically slidable and the lower sash **20** is fixed. As will be appreciated, either sash may be slidable with the other being fixed. The upper sash **26** comprises spaced apart parallel left and right stiles **28, 30** joined together at their upper and lower ends by, respectively, a top rail **32** and a meeting or bottom rail **34**. The cross-sectional contours of the stiles and rails is fundamentally a channel section comprising, as shown in FIGURE 4, spaced apart walls **88, 89** joined together by a web **91**. The stiles and top rail are also provided with an outwardly projecting tongue formed from the material of the web to slidingly engage, respectively, openings in the jamb and header of the window frame. A lock **36, 38** is provided in each upper corner of the sash **26** on the interior surface or face thereof.

The lower sash **20** comprises left and right stiles **40, 42** joined together at their upper and lower ends by, respectively, a meeting or top rail **44** and a bottom rail **46**. Each sash is provided with a window pane element **48, 50**. The stiles and rails of both the upper and lower sashes are preferably fabricated from aluminum or one of its alloys.

The upper right hand corner of the sash **26** with the lock **38** removed is illustrated in FIGURE 3. The construction of the left corner of the sash **26** is the mirror

image of the corner illustrated, and the description of FIGURE 3 also applies to the left corner. As will be noted, the end portions of the rail 32 and stile 30 are mitered to form a square corner at the juncture thereof. A pair of spaced slots 52, 54 are provided in the rail 32 to receive extending tabs 56, 58 provided on the lock 38. The tabs 56, 58 act to position and support the lock. As previously mentioned, the rail 32 and stile 30 are each provided with a longitudinally extending tongue 60, 62. As will be noted in FIGURES 4 and 5, the tongues are hollow and receive portions of corner bracket 64.

The bracket 64 is an L-shaped member having one flat leg 66 which is received in the tongue 60 and a second flat leg 68 which is received in the tongue 62. The corner 70 is rounded to permit easy insertion of the bracket into the top rail and stile. A pair of spaced openings 72, 74 are provided, respectively, in the legs 66, 68. After the bracket has been inserted into the sash structure, one wall of each tongue 60, 62 is staked into the openings 72, 74 as will be noted in FIGURES 2 and 3 at 76, 78. As shown in FIGURE 5, the staked in portions of the tongue engages the bracket openings and fixes the bracket in position. In this manner, the top rail is secured to the stile to form a rigid structure. Additionally, the bracket, which is preferably constructed of steel or a similar material acts to reinforce the sash structure.

The second function of the bracket 64 is to provide for securement of the locks 36, 38 to the sash 26. The legs 66, 68 are extended beyond the point necessary for securing the stile and the top rail. A tab 80, 82 is provided at each end of legs 66, 68. Each tab is offset by wall portions 84, 86 to position the tabs adjacent to the inner wall 88, 90 of, respectively, the top rail 32 and right stile 30. An opening 92, 94 is provided in each tab to receive a self-threading screw. If desired, however, the openings 92, 94 may be threaded to receive a conventional bolt or screw. An opening 96, 98 is also provided in the walls 88, 90 to register with the openings in the tabs 80, 82. As will be noted in FIGURE 3, the opening 96 is elongated to permit alignment with the opening 92. The glass pane 48 is secured in the rail 32 in weather-tight relationship thereto by means of a sealing member 100. The frame header 18 is shown in phantom in FIGURE 4 to illustrate the cooperate relationship of the sash tongue therewith. As will be appreciated, the frame header is normally provided with a sealing element therein to engage the tongue 60 and make the unit weather-tight.

Referring to FIGURE 2, the lock 38 is provided with tabs 102, 104 having openings 105 to receive self-threading screws 106, 108 which engage the openings 92, 94 of the bracket tabs as shown in phantom in FIGURE 4. This arrangement secures the lock to the sash but permits removal of the lock if for any reason such removal is necessary. The lock comprises a body 110 having a spring-urged catch 112 which may be retracted by compression of lever 114. The catch 112 extends into jamb 16 to engage spaced projections provided therein. Retraction of the catch permits the sash to be moved up or down in the jamb. When the sash has been positioned at the desired location, the lever 114 is released and the catch 112 will engage the stop member immediately therebeneath.

Having thus described my invention, I claim:

1. The combination comprising a vertically slidable window sash including spaced apart parallel stiles joined together at their top and bottom ends by, respectively, a top rail and a bottom rail; the stiles and top rail being channel sections having spaced apart walls joined together by a web; a hollow tongue projecting from each of said webs and extending longitudinally of its respective stile and top rail; a pair of corner brackets provided to join the top rail to the stiles; each of said corner brackets comprising an L-shaped member having one leg received in, and secured to, the portion of the top rail tongue adjacent to an end thereof and a second leg received in, and secured to, the end portion of the stile tongue adjacent thereto; each of said legs having a tab at its outer end and spaced therefrom by a wall portion to a position adjacent one wall of, respectively the top rail and stile; each of the tabs having an opening therethrough; the aforesaid adjacent walls of the top rail and stile each having an opening in registry with the respective openings in the tabs; a pair of locks each having openings in registry with a pair of the top rail and stile openings; and threaded fastening means extending through the lock openings and threadingly engaging the tab openings to thereby secure each lock to the sash.

2. A window sash including a pair of spaced apart parallel stiles joined together at one end by a rail; said stiles and rail being channel sections of a relatively soft metal and comprising spaced apart walls joined together by a web; each of said stiles and rail having a hollow outwardly projecting tongue on the web extending longitudinally thereof; a corner bracket of a relatively hard metal provided at the juncture of each stile with the rail; each of said brackets being substantially L-shaped and having a first leg received in, and secured to, the rail tongue adjacent to one end thereof; a second bracket leg extending from the first leg into, and secured to, the portion of the stile tongue adjacent thereto; each of the bracket legs having a tab extending therefrom; each of said tabs having an opening therethrough; one wall of the rail and one wall of each stile having openings in registry with said tab openings; a pair of locks each having structure with a pair of openings therethrough in registry with a pair of tab openings of one corner bracket; and threaded fastening means extending through each lock opening into threaded engagement with a tab opening to thereby secure each lock to the sash.

3. A window sash construction including a pair of spaced apart parallel stiles joined together at one end by a rail; said stiles and rail being channel sections comprising spaced apart walls joined together by a web; each of said stiles and rail having a hollow outwardly projecting tongue on the web extending longitudinally thereof; a corner bracket provided at the juncture of each stile with the rail; each of said brackets comprising first and second substantially flat legs joined together to form an L-shaped member; each leg having openings therethrough at a point adjacent to the juncture of the legs; the first leg being received in the rail tongue adjacent to one end thereof; the second bracket leg extending from the first leg into the portion of the stile tongue adjacent thereto; material of the rail tongue and stile tongue being staked into the openings of said bracket legs to thereby secure the brackets to the rail and stile; each of the bracket legs having a tab extending therefrom; each of said tabs having an opening therethrough; one wall of the rail and one wall of each stile each having an opening in registry with one of said tab openings; a pair of locks each having structure with a pair of openings therethrough in registry with a pair of tab openings of one corner bracket; and threaded fastening means extending through each lock opening into threaded engagement with a tab opening to thereby secure each lock to the sash.

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