Nov. 20, 1934. W. S. HAMM 1,981,355

SASH CONSTRUCTION

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Fig. 1.

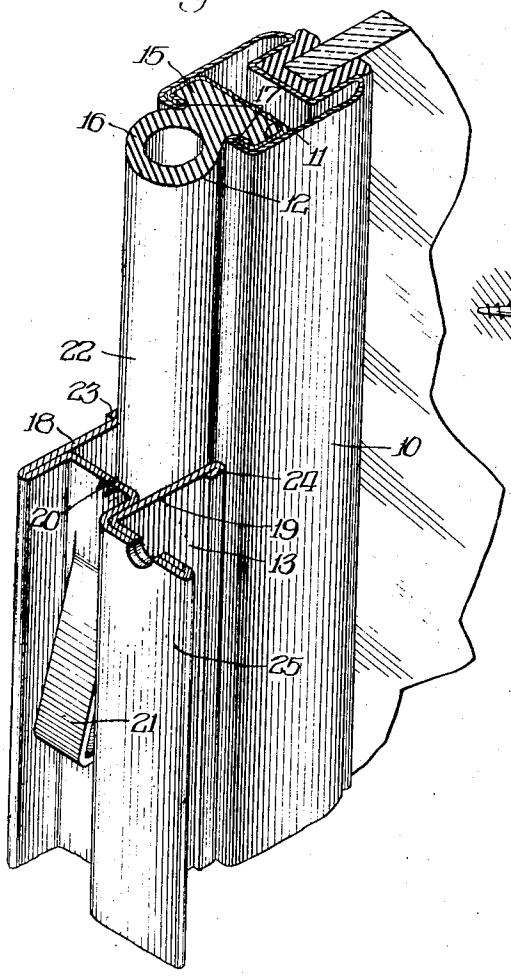


Fig. 2.

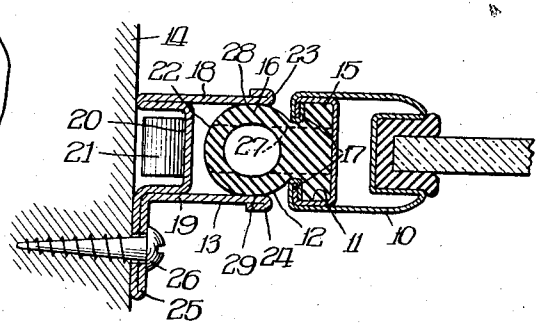


Fig. 3.

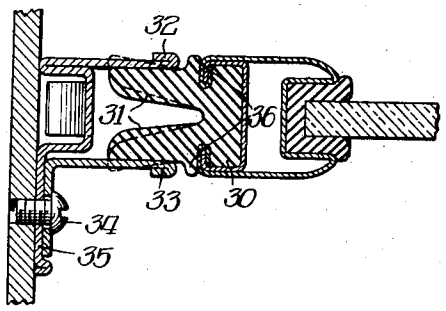


Fig. 4.

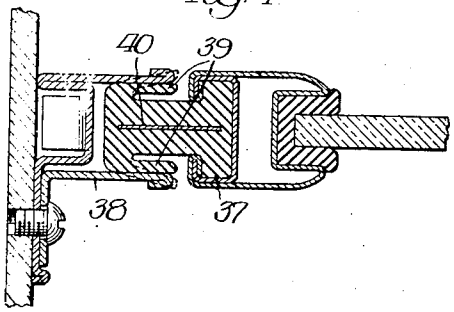
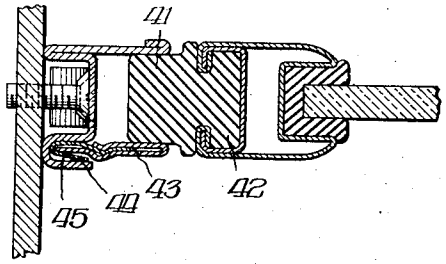


Fig. 5.



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Fig. 6

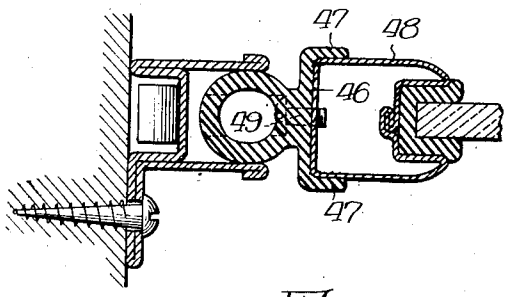


Fig. 7

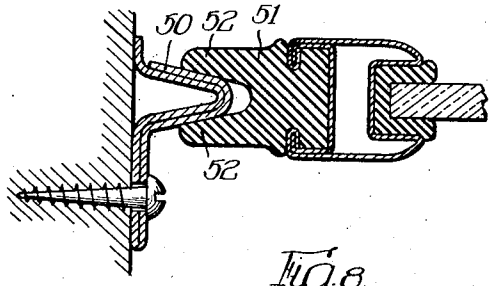


Fig. 9

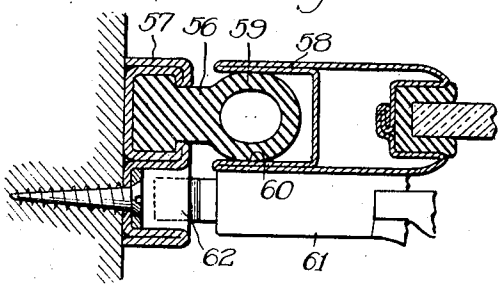


Fig. 8

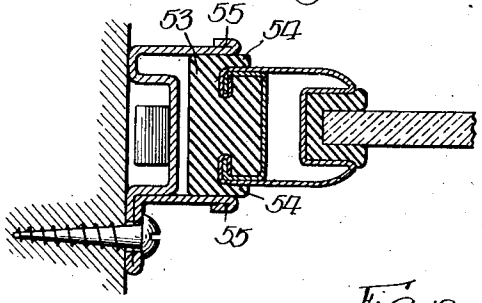


Fig. 11

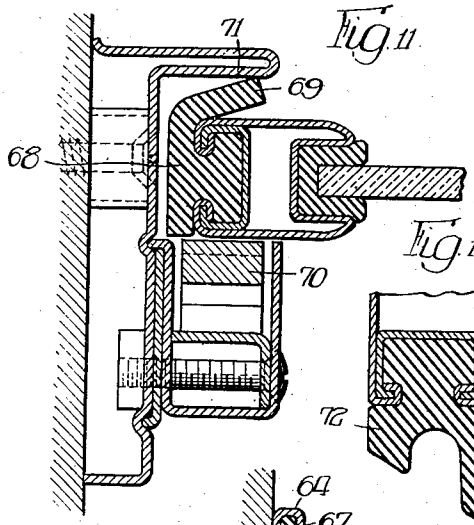


Fig. 12

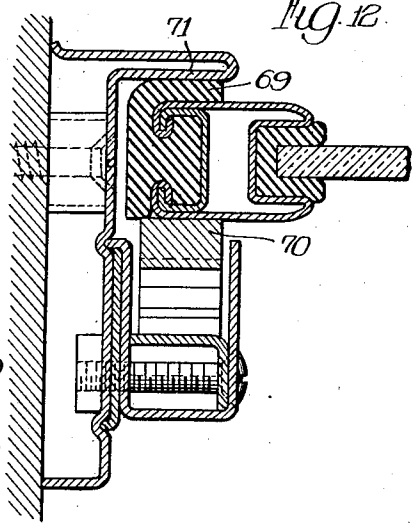
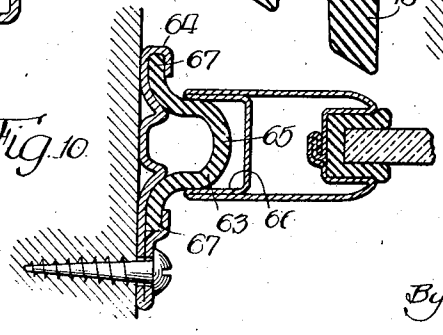


Fig. 13.

Fig. 10



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UNITED STATES PATENT OFFICE

1,981,355

SASH CONSTRUCTION

William S. Hamm, Elkhart, Ind., assignor to The Adlake Company, Chicago, Ill., a corporation of Illinois

Application May 11, 1932, Serial No. 610,645

15 Claims. (Cl. 189—72)

This invention relates to sash construction, and is particularly concerned with the mounting of vertically slidable sash of the type used in buses.

In the past considerable difficulty has been experienced in getting the sash and guides in the window openings of buses to stand up under the severe jolting and vibration to which they are constantly subjected.

The purpose of the present invention is to provide an improved sash and guide organization which will overcome the above mentioned difficulty, will be fully weatherproof, will not rattle, will not stick or bind, and will be light in weight, inexpensive to manufacture and easy to operate.

Other more specific objects and advantages of the invention will be apparent to those skilled in the art upon a full understanding of the construction, arrangement and coaction of the parts entering into the improved organization.

While the invention is especially applicable to the windows of buses, its use with other kinds of windows is of course contemplated.

Several different forms of the invention are presented herein by way of exemplification, but the invention is capable of being embodied in other structurally modified forms coming equally within the spirit of the invention and the scope of the appended claims.

In the accompanying drawings:

Fig. 1 is a fragmentary perspective view of a sash and guide organization which embodies one form of the invention;

Fig. 2 is a transverse section through the organization shown in Fig. 1;

Figs. 3 to 10 inclusive are somewhat similar transverse sections which illustrate other modified embodiments of the invention;

Figs. 11 and 12 are transverse sections through a modified construction, in a sash of the throw-over type, showing the sash before and after being forced outwardly; and

Fig. 13 is a fragmentary section through a bottom rail sealing strip which may be used with the sash shown in Figs. 11 and 12.

The construction shown in Figs. 1 and 2 will first be described. In those views the numeral 10 designates one of the side rails of a vertically slidable sheet metal sash. The rail 10 is provided in its edge with a vertically extending groove 11 in which a rubber extension strip 12 for the rail is positioned. The strip 12 is coextensive in length with the side rail 10 and projects beyond the edge of the latter into a channeled sheet metal guide 13 which is attached to one of the sides 14 of the window opening. Since the above described organization of parts is duplicated at the other side of the window opening, only one side is herein shown and described.

The rubber strip 12 is provided with a solid base portion 15 of generally rectangular cross section and a hollow head portion 16 of generally annular cross section. The base portion 15 is forced into the groove 11 and is held tightly therein against inadvertent movement by two inturned flanges 17 on the edge of the rail. The head portion 16 is preferably of a little less thickness than the side rail 10, whereby to permit the guide 13 to be made of substantially the same thickness as the rail with the outer wall 18 of the guide in approximately the outer plane of the sash and with the inner wall 19 of the guide in approximately the inner plane of the sash. The head portion 16 projects into the channel present between the walls 18 and 19 of the guide and is preferably compressed somewhat by the same in a freely slidable condition.

The back 20 of the guide—which is preferably set out away from the side of the window opening far enough to accommodate rack formations 21 for coaction with a locking bolt in the bottom rail of the sash—is spaced slightly from the opposed edge 22 of the rubber strip in the normal centered position of the sash, and the edges 23 and 24 of the walls of the guide are preferably spaced a somewhat greater distance from the opposed metallic edge portions of the sash, whereby to afford a fully cushioned support for the sash in all positions of the same and prevent any metal-to-metal contact. The guide 13 is shown as being of one-piece sheet metal construction, with an inwardly extending flange 25 at its base for the reception of attaching screws 26, but it may of course be made in other ways and of other materials if desired.

The rubber extension strip 12, while quite resilient, possesses sufficient body resistance to easily withstand the application of high pressures to the sash in directions at right and oblique angles to the plane of the sash, the head portion 16 of the strip being of such shape, proportioning and body as to effectively take up all of the sheering stresses with a resiliently yieldable but nevertheless quickly absorbing action. The nature of the support afforded by the rubber extension strips 12 at the sides of the sash renders the window noiseless and greatly prolongs the life of the same.

At the point where the rubber strip 12 laps with the adjacent end of the bottom rail of the sash a hole 27 may be provided through the cen-

ter of the strip for the free working accommodation of the locking bolt, thereby permitting the strip 12 to seal the sash without interruption from top to bottom along the contact lines 28 and 29.

The strip 12 is preferably molded to shape and is preferably made from a tough, resilient, smooth surfaced grade of rubber, but it is of course contemplated that other materials possessing the requisite qualities might be used instead or in combination therewith in the manufacture of the strip. Should the strip require replacement after having been in service for a long period of time, it may be easily pried out of the groove 11 with a screw driver or other tool and replaced with a new strip.

In equipping a vertically slidable sash with the side rail extension strips of this invention, it is advisable to apply cushioning strips of rubber or other suitable material to the top and bottom rails of the sash in order to afford a yieldable support at all points about the periphery of the sash. The meeting ends of the strips at the corners of the sash may be mitered to fit nicely together or they may be connected in some other satisfactory manner.

The novel side rail extension strip which forms the subject matter of this invention will allow the sash to slide freely up and down in the guides and will effectively absorb all the shocks, vibrations, twisting strains and other stresses to which the sash may be subjected. At the same time, the extension strip will permit the sash to move horizontally a little in the plane of the same to adjust itself to the guides, without, however, permitting of any solid metal-to-metal engagement of the sash with the guides.

In the modification shown in Fig. 3, the projecting portion of the rubber side rail extension strip 30 is bifurcated to form two flanges 31 which are preferably compressed resiliently between the side walls 32 and 33 of the guide. In this form of the invention the side wall 33 is shown as a separate member of L-shaped cross section which is adjustably positioned by a clamping screw 34 on the base flange 35 of the guide. By making the side wall 33 as a separate part, the latter may be moved toward or away from the side wall 32 to obtain any desired degree of compression on the confined portions of the strip 30. The strip 30 in this form is provided with outwardly directed beads 36 which are disposed in slightly spaced relation to the edges of the side walls 32 and 33 in alignment with the latter for cushioning abutment with such edges when the sash settles toward one guide or the other.

In the modification shown in Fig. 4, the rubber side rail extension strip 37 is provided within the guide 38 with reversely turned lips 39 for resilient coaction with the side walls of the guide. In this particular form the rubber strip is shown as reinforced with a thin metallic spring strip 40 which is molded in the strip at the center of the latter. The reinforcing strip 40 will flex slightly with the rubber strip and aid the latter in absorbing sheering stresses.

In the modification shown in Fig. 5, the head portion 41 of the extension strip 42 is of solid generally rectangular cross section and one of the side walls 43 of the guide is resiliently pressed against the same by the action of a metallic spring strip 44 which is located in a groove 45 at one side of the guide. In this form, a doubly resilient yet nevertheless strong and rugged support for the sash is obtained.

In the modification shown in Fig. 6, the attaching portion 46 of the rubber extension strip is provided with side flanges 47 which lap against the side faces of the rail 48. In this embodiment, the rubber strip is attached to the rail by means of screws 49 which are positioned in apertures formed in the strip.

In the modification shown in Fig. 7, the guide 50 at the side of the window opening is of ribbed as distinguished from groove formation and the head portion 51 of the rubber extension strip is bifurcated to provide two flanges 52 which resiliently embrace the preferably converging sides of the guide.

In the modification shown in Fig. 8, the head portion 53 of the rubber strip is provided with side flanges 54 which extend back against the sides of the sash rail, and the sides 55 of the guide bear against the outer faces of the rubber flanges 54.

In the modification shown in Fig. 9, the rubber extension strip 56 is carried by the guide 57 instead of by the sash rail 58 and extends the full height of the guide. In this form the head portion 59 of the extension strip is compressed slightly within a channel 60 in the edge of the sash, and the lock 61 for the sash is mounted on the inner face of the bottom rail of the latter for coaction with a lock rack 62 on the inner side of the guide.

In the modification shown in Fig. 10, the rubber strip 63 is carried by the guide 64 and is of sheet construction, with the central portion 65 of the strip bowed outwardly to form a resilient guide rib for coaction with a channel 66 in the edge of the sash and with the edge portions 67 of the strip clamped securely in position by the edge portion of the guide.

In the modification shown in Figs. 11, 12 and 13, the rubber strip 68 is mounted in a groove in the side rail and is provided at the outer face of the sash with a reversely turned flange 69, which flange tends to assume the position shown in Fig. 11. In this embodiment of the invention, a sash and guide organization of the throw-over type is illustrated, provided with a device 70 of any suitable description for forcing the sash outwardly against the outer wall 71 of the guide. In the position of the sash which is shown in Fig. 11, the throw-over mechanism 70 is retracted, permitting the sash to be loose in the guide, while, in the position shown in Fig. 12, the device 70 is in operative position and the sash is wedged outwardly, forcing the rubber flange 69 tightly against the outer face of the sash in firm weather tight engagement with the outer wall 71 of the guide. In constructions of this character, and also in those of the character shown in Figs. 6 and 8, where there is a rubber flange disposed against the outer face of the sash, a bottom rail rubber sealing strip 72 of the type shown in Fig. 13 may be advantageously employed, the forwardly projecting portion 73 of the sealing strip being disposed with its outer face flush with the outer face of the rubber flange which is positioned against the outer face of the side rail, thereby giving a smooth and uninterrupted joint at the point where the ends of the rubber members meet.

In practically all of the above described embodiments of the invention, the rubber strips are so shaped and arranged as to insulate the sash from the guides. This permits either the sash or the guides or both to be made of aluminum, if desired, as the interposed strips will preclude

any deteriorating electrolytic action taking place, which would occur if metal-to-metal contact were permitted or if the interposed strips permitted the holding or seepage therethrough of water.

The side beads 36 shown in Fig. 3 on the side rail extension strip, and the modified but equivalent formations shown in Figs. 5 and 6, not only serve to keep the sash more or less centered between the guides but are also of particular advantage when used with sash which are quite wide in proportion to their heights, since such formations prevent the sash from cocking in the guides when being raised or lowered by engaging with the edges of the guides over a relatively quite small area in practically frictionless line contact.

While the novel side rail or guide extension strips which form the subject matter of this invention are preferably made of rubber, the same might be made of some other resiliently yieldable non-metallic cushioning material or combination of materials, wherefore the word "rubber" as used in the following claims is to be understood as including within its meaning other suitable materials of a generally similar character.

I claim:

1. The combination with a sheet metal sash, and guides at the sides of the same, of rubber extension strips on the side rails of the sash in vertically slidable engagement with the guides, said extensions being characterized by base portions which fit into grooves in the side rails and by head portions which project into the guides.

2. The combination with a sheet metal sash, and guides at the sides of the same, of rubber extension strips on the side rails of the sash in vertically slidable engagement with the guides, said extensions being characterized by solid base portions of generally rectangular cross section which fit into grooves in the side rails and by hollow head portions of generally annular cross section which project into the guides.

3. The combination with a sheet metal sash, and guides at the sides of the same, of rubber extension strips on the side rails of the sash in vertically slidable engagement with the guides, said extensions being characterized by solid base portions of generally rectangular cross section which fit into grooves in the side rails and by hollow head portions of generally annular cross section which project into the guides, the walls of the hollow head portions of the rubber extension strips being of such thickness and arrangement as to retain the sash in substantially the median plane of the guides when the sash is subjected to pressure at right angles to such plane.

4. The combination with a sheet metal sash, and guides at the sides of the same which terminate short of the side rails of the sash, of rubber extension strips on the side rails of the sash in vertically slidable engagement with the guides, said extensions having sufficient resistance to sheering stresses as to retain the sash in substantially the median plane of the guides when the sash is subjected to pressure at right angles to such plane.

5. The combination with a sash, and guides at the sides of the same, of rubber extension strips on the side rails of the sash in vertically slidable engagement with the guides, said extensions being characterized by base portions which are secured to the side rails and by head portions beyond the base portions which project into laterally interlocked engagement with the guides.

6. The combination with a sash, and guides at the sides of the same, of rubber extension strips on the side rails of the sash in vertically slidable engagement with the guides, said extensions being characterized by base portions which are secured to the side rails, by head portions beyond the base portions which project into laterally interlocked engagement with the guides, and by intervening portions which are of less thickness than the head portions.

7. The combination with a sash, and guides at the sides of the same, of rubber extension strips on the side rails of the sash in vertically slidable engagement with the guides, said extensions being characterized by base portions which are secured to the side rails, by head portions beyond the base portions which project into laterally interlocked engagement with the guides, and by intervening portions which are of less thickness than the base portions.

8. The combination with a sash, and guides at the sides of the same, of rubber extension strips on the side rails of the sash in vertically slidable engagement with the guides, said extensions being characterized by base portions which are secured to the side rails, by head portions beyond the base portions which project into laterally interlocking engagement with the guides, and by intervening portions which are of less thickness than either the head or base portions.

9. The combination with a sash, and guides at the sides of the same, of rubber extension strips on the side rails of the sash in vertically slidable engagement with the guides, said extensions being characterized by base portions which are secured to the side rails, by head portions beyond the base portions which project into laterally interlocked engagement with the guides, and by shoulders which will abut with the edges of the guides to prevent canting of the sash.

10. The combination with a sash, and guides at the sides of the same, of rubber extension strips on the side rails of the sash in vertically slidable engagement with the guides, said extensions being characterized by base portions which are secured to the side rails, by head portions beyond the base portions which project into laterally interlocked engagement with the guides, and by laterally projecting lips which will abut with the edges of the guides to limit movement of the sash toward either of the guides.

11. The combination with a sash, and guides at the sides of the same, of rubber extension strips on the side rails of the sash in vertically slidable engagement with the guides, said strips being characterized by resiliently collapsible tubular head portions which project into the guides.

12. The combination with a sash, and guides at the sides of the same, of rubber extension strips on the side rails of the sash in vertically slidable engagement with the guides, said strips being characterized by resiliently collapsible bifurcated head portions which project into the guides.

13. The combination with a sash, and guides at the sides of the same, of rubber extension strips on the side rails of the sash in vertically slidable engagement with the guides, said strips being characterized by lips which project laterally therefrom at the edges of the sash for abutting coaction with the edges of the guides.

14. The combination with a sheet metal sash having grooves in the side rails, and inturned flanges on the edges of such grooves; of guides at the sides of the sash having grooves in opposition to those in the side rails; and rubber exten-

sion strips at the sides of the sash positioned partly in the grooves in the side rails and partly in the grooves in the guides; said extension strips being stationary with respect to the side rails and slidable longitudinally with respect to the guides, and said strips having substantially solid generally rectangular base portions positioned behind the flanges in the grooves in the side rails in interlocked association with such flanges, hollow resiliently compressible head portions positioned in the grooves in the guides, and intervening portions provided with shoulders for abutment with the outer faces of the inturned flanges on the side rails.

15. The combination with a sash having grooves in the side rails, and inturned flanges on the edges of such grooves; of guides at the sides of the sash having grooves in opposition to those in the side rails; and rubber extension strips at the sides of the sash positioned partly in the grooves in the side rails and partly in the grooves in the guides; said extension strips being stationary with respect to the side rails and slidable longitudinally with respect to the guides, and said strips having base portions positioned behind the flanges in the grooves in the side rails in interlocked association with such flanges, and head portions positioned in the grooves in the guides, said head portions being more readily compressible than said base portions.

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