

July 10, 1934.

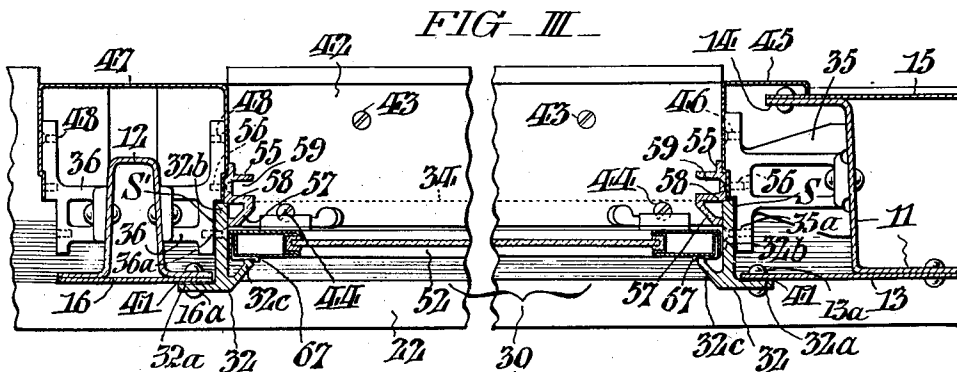
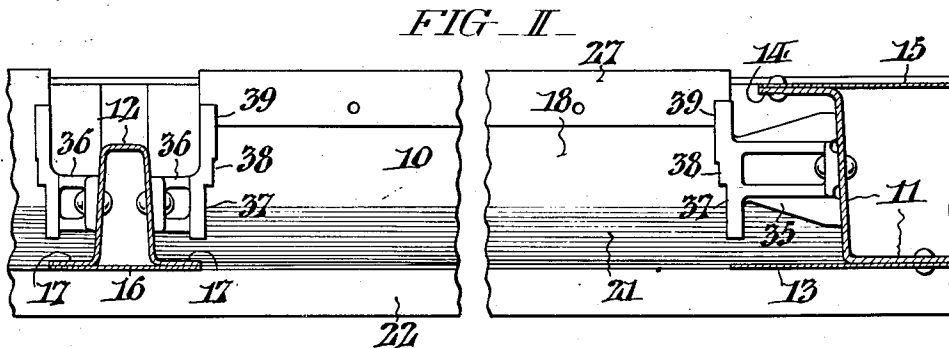
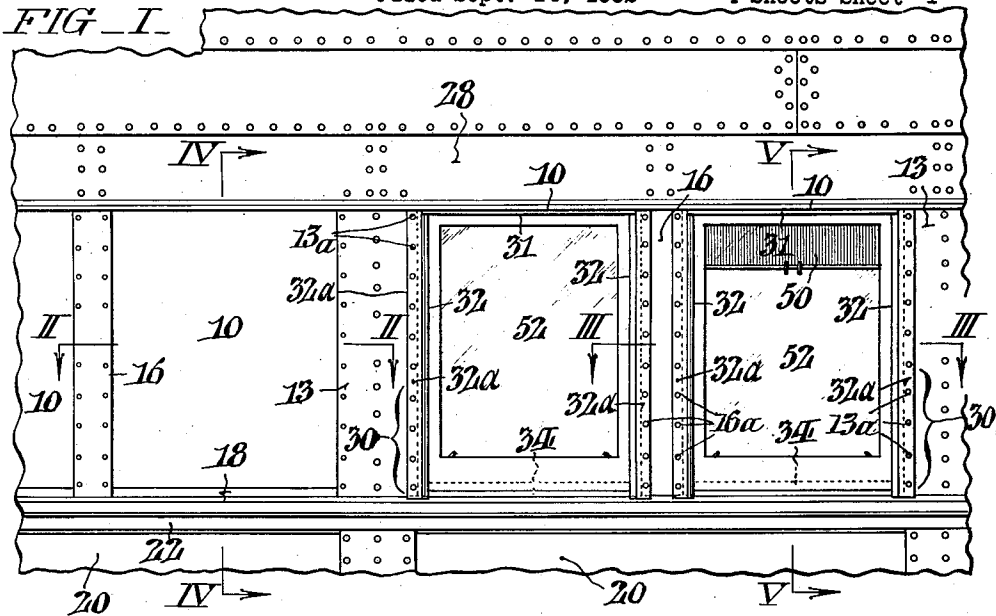
R. E. MILLER

1,965,902

CAR WINDOW

Filed Sept. 14, 1932

4 Sheets-Sheet 1



WITNESSES:

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Hubert Fuchs

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4 Sheets-Sheet 3

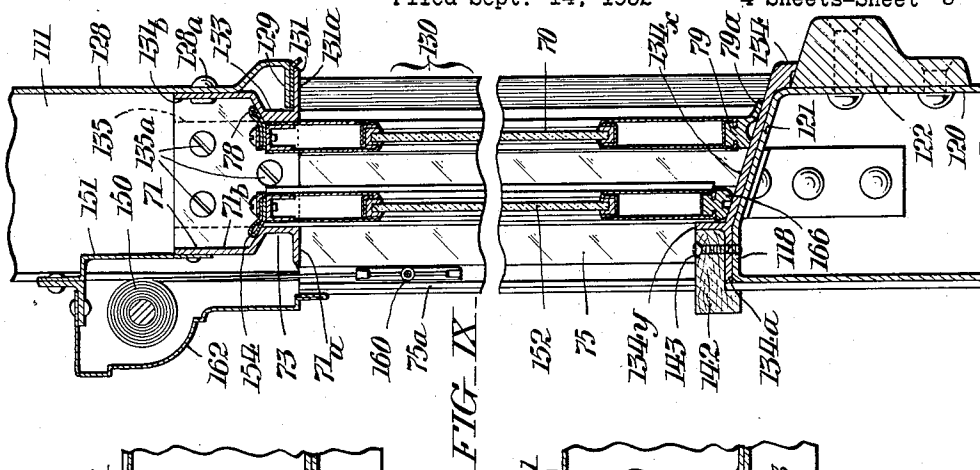


FIG. IX

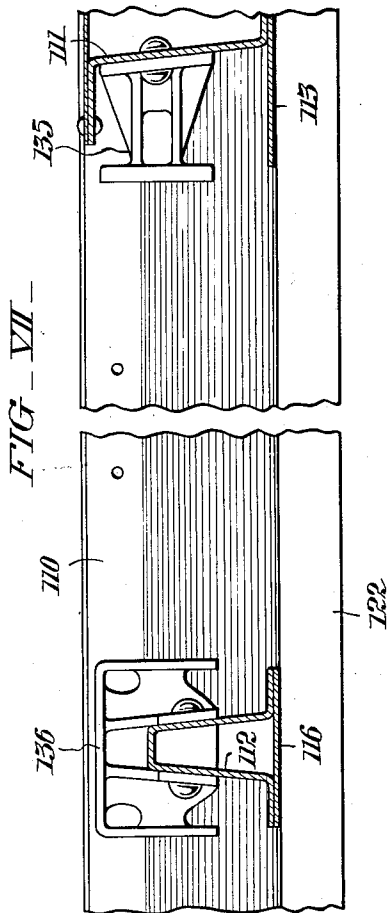


FIG. VII

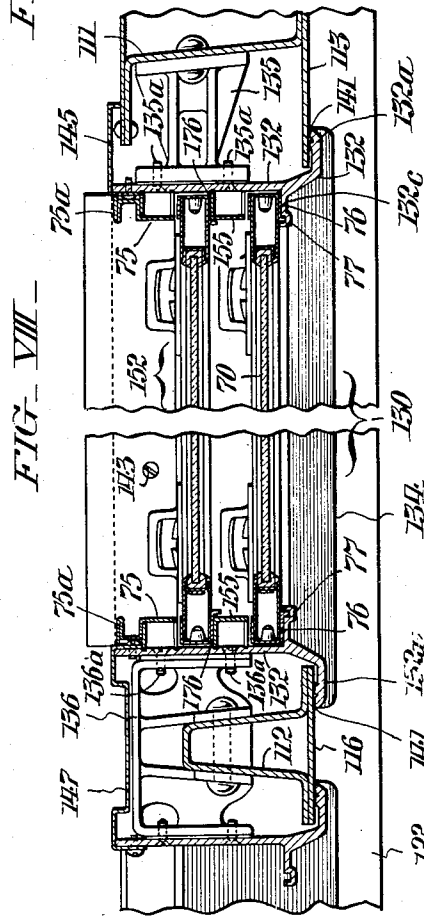


FIG. VIII

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UNITED STATES PATENT OFFICE

1,965,902

CAR WINDOW

Robert E. Miller, Altoona, Pa.

Application September 14, 1932, Serial No. 633,094

18 Claims. (Cl. 105—401)

This invention relates to railway car windows; and it is concerned more particularly with windows for metallic passenger coaches.

In the construction of metallic railway cars, the walls are made hollow with inner and outer sheathing plates secured to roof supporting posts along opposite sides of the car body; and openings are provided in the side walls into which the windows are subsequently placed. Heretofore it has been customary to fit the frames of the windows piece by piece into the openings provided for them in the car body. Such individual fitting of metallic parts was tedious and slow, as well as costly from the standpoint of the labor involved; and it frequently happened that, due to inaccuracies in fitting, the frames would not be perfectly rectangular and therefore interfered with free movement of the sashes. Windows imperfectly constructed under the conditions noted were, moreover difficult to make weathertight.

Considered from the broadest aspect, my invention is directed toward overcoming the drawbacks whereto reference has been made, which desideratum I make possible of realization in practice through provision of a sliding sash window characterized by a pre-assembled rigid frame, which, for convenience of nomenclature, I term an "adapter" frame, the same being designed for insertion into the window opening of the car body with its head rail underlapping the top edge of the opening and its bottom rail resting on the sill edge of the opening, and having outward attaching flanges on its jamb rails to marginally overlap the side edges of the window.

Other objects and attendant advantages will be manifest from the detailed description following in connection with the attached drawings, wherein Fig. I is a fragmentary view showing, in part, the side elevation of a railway passenger car body equipped with windows constructed in accordance with my invention, one of the window openings having been left unframed.

Fig. II is a fragmentary detail sectional view drawn to a larger scale, and taken as indicated by the arrows II—II in Fig. I crosswise of the unframed window opening.

Fig. III is a view similar to Fig. II, but taken crosswise of one of the completed windows, as indicated by the arrows III—III in Fig. I.

Fig. IV is a vertical sectional view taken as indicated by the arrows IV—IV in Fig. I, through the unframed window opening of the car body.

Fig. V is a view like Fig. IV taken as indicated by the arrows V—V in Fig. I, through a completed window.

Fig. VI shows a perspective view of the adapter frame of my improved window.

Figs. VII, VIII and IX are views corresponding respectively to Figs. II, III and V, showing a double sash car window embodying my invention; and

Fig. X is a perspective view of the adapter frame of the double sash window.

Referring first to Figs. I—V wherein I have illustrated a single sash window structure embodying the present invention, the car body therein shown for the purposes of exemplification is of steel construction and formed in its hollow sides with horizontally aligned window openings 10 whereof one is left unframed in Figs. I, II and IV. As shown, these window openings 10 are set apart between channel section roof supporting posts 11 and 12 concealed in the hollows of each side wall of the car body, the wider posts of the type 11 alternating with the narrower posts of the type 12. To the frontal face of each post 11 is secured a vertical outer sheathing plate 13 which has substantial projection beyond opposite sides of the posts; and to the lateral flanges 14 of said post is secured the vertical inner sheathing plate 15. From Fig. II it will be noted that the posts 12 are reversely positioned with regard to the posts 11, and each has a vertical outer sheathing plate 16 secured to its lateral flanges 17. At the bottom of each window opening 10 there is incorporated with the side wall of the car body, a sill supporting member 18 of hollow channel section having a relatively deep depending frontal flange 19 which marginally overlaps the outer sheathing panel 20, see Fig. IV. As shown, the sill supporting member 18 has a bevel 21 corresponding to the top slope of a supplemental sill rail 22 which extends the full length of the car body and which is secured by means of rivets 23. A short depending flange 24 along the rear edge of the sill supporting member 18 is overlapped by the lower horizontal inner sheathing panel 25 of the car body and secured by rivets 26 which also serve to secure a cover angle strip 27. The upper horizontal outside sheathing or eave plate 28 above the window openings 10 is outwardly joggled along its lower edge with formation of a square cap bead 29 which, like the sill bar 22, extends the full length of the car body.

Coming now to my improved single sash window structure, the same will be observed to comprise an adapter frame 30 which is illustrated in perspective in Fig. VI. As shown, the head rail 31 of this adapter frame 30 is of L cross section, with a forwardly directed horizontal flange 31a

and an upward vertical flange 31b, the opposite ends of said head rail abutting the jamb rails 32 whereof the top ends are L-notched as at 33 to correspond to the cross sectional configuration of said head rail. Referring to Figs. III and VI, the jamb rails 32 of the adapter frame 30 are of T-section with outward attaching flanges 32a at right angles to the median webs 32b and with inward sash guiding flanges 32c at an acute angle to said median webs. The bottom rail 34 of the adapter frame 30 is of right angle section with a comparatively deep horizontal flange 34a and a shorter frontal flange 34b which depends from said horizontal flange; and, like the top rail 31, said bottom rail has its ends abutting the jamb rails 32. Both the head and bottom rails 31 and 34 of the adapter frame 30 are narrower as regards depth than the side or jamb rails 32; and it is to be particularly noted that the horizontal flange 31a of the head rail is flush with the attaching flanges 32a of the jamb rails 32 at the front of the frame; while at the rear of the frame, the edge of the horizontal flange 34a of the bottom rail 34 is flush with the edges of the median webs 32b of the jamb rails, the described relationship being best illustrated in Figs. III and V. The head and bottom rails 31 and 34 of the adapter frame 30 are thus disposed in spaced vertical planes for a reason which will be obvious from further description. The parts constituting the adapter frame may be riveted one to another; but, for the sake of permanent rigidity, I prefer to weld them together at the regions of mutual abutment.

As a means to support adjunctive parts of the window, I have provided in each instance brackets, such as shown at 35 and 36, pairs of which are secured by rivets or bolts respectively to opposite sides of the posts 11 and 12 within the window openings 10, said brackets having their opposing faces correspondingly stepped respectively as at 37, 38 and 39.

In placing an adapter frame 30 into one of the window openings 10 of the car body, the top rail 31 of such frame is "hooked in" under the inward flange 29a of the cap bead 29 on the eave plate 28 as indicated in dot and dash lines in Fig. IV, and the frame thereupon swung inward until the lateral attaching flanges 32a of its jamb rails 32 engage the vertical sheathing plates 13, 16 respectively on to the posts 11 and 12. With this accomplished, the adapter frame 30 is allowed to drop so that the depending flange 34b of its bottom rail 34 rests evenly on the bevel 21 of the sill supporting member 18, whereupon the frame is secured by means of screws 35a and 36a which take into the faces 37 of the brackets 35 and 36. To further secure the adapter frame 30, rivets 13a and 16a are passed through the attaching flanges 32a of the jamb rails 32 and the overlapped margins of the vertical outer sheathing plates 13, 16. Incidentally, caulking material is interposed between the inward flange 29a of the eave plate 28 and the horizontal flange 31a of the top rail 31 of the adapter frame 30 as conventionally indicated at 40 in Fig. V, and between the attaching flanges 32a of the jamb rails 32 and the outer vertical sheathing plates 13, 16 as at 41 in Fig. III, to insure weather-tightness at these regions. When necessary for the proper registry between preallocated rivet holes in the plates 13 and 16 and the attaching flanges 32c of the adapter frame jamb rails 32, shims are interposed between the side flanges 32b of said

jamb rails as indicated by the heavy lines at S, S' in Fig. III.

With the adapter frame 30 now permanently secured, a sill bar 42 of wood is placed and made fast with screws 43 and 44 (Fig. V) to the sill supporting member 18 and the bottom rail 34 of said adapter frame. A finishing molding strip 45 (Fig. III) of angle cross section is next secured to the faces 38 and 39 of the brackets 35 on the post 11, by means of screws 46, said molding being so shaped cross sectionally and proportioned as to hide the rivets whereby the vertical inner sheathing plate 15 is fastened to the post. At the opposite side of the window opening 10, a box molding 47 is placed over the post 12 as shown in Fig. III and is secured to the faces 38 and 39 of the brackets 36 at opposite sides of such post by means of screws 48. To accommodate a roller curtain 50 (Fig. V) for the window, a housing 51 of sheet metal is inserted into the hollow of the side wall of the car body above the window opening. After this, the sash shown at 52 in Figs. III and V is introduced from the inside of the car in such manner that its top edge is engaged between the head rail 31 of the adapter frame 30 and an opposing hollow flange 53 formed on the curtain housing 51, said flange 53 being surfaced with weathering material 54. Guide strips 55 for the sash 52 are next secured to the brackets 35, 36 on the posts 11 and 12 over the sides of the moldings 45, 47 by means of screws 56, said guide strips, it will be noted, being of irregular cross section with formation of opposing flanges 57 to cooperate with the inward guide flanges 32c of the jamb rails 32 of the adapter frame 30 in retaining the sash. A groove of definite width for guidance of the sash 52 is determined through engagement of shoulders 58 of the guide strips 55 with the inner edges of the median webs 32b of the jamb rails 32 of the adapter frame 30. The channels 59 in the guide strips 55 serve for the followers 60 attached to the lower edge of the curtain 50. The window is finished at the top by inter-connecting moldings 61, 62 (Fig. V), the first of which covers the access opening into the curtain roller housing 51 while the second hides the housing 51 as well as the longitudinal angle 63 secured to the top inside sheathing plate 64 of the car body. The window sash frame 52 is in this instance constructed from metal, and as shown in Fig. V, it is provided along its bottom with a downward frontal tongue projection 65 to overlap the bottom rail 34 of the adapter frame 30. Spring weather strips 67, 66 are secured to the side and bottom edges of the sash 52 to insure weather-tightness with the adapter frame.

In the double sash window construction of my invention illustrated in Figs. VII-X inclusive, the inner and outer sashes are respectively designated by the numerals 152 and 70, and the adapter frame by the numeral 130, the latter being generally similar to the adapter frame 30 of the first embodiment and set into the window opening 110 of the car body in the same way. In order to accommodate the two sashes 70 and 152, the adapter frame 130 is made deeper than the adapter frame 70, and the brackets 135 and 136 on the car body posts 111 and 112 whereto said frame is secured by screws 135a and 136a, are somewhat differently fashioned in view of this change, as will be apparent by comparison of Figs. VIII and X with Figs. III and VI. As shown in Figs. IX and X, the head rail 131 of the adapter frame 130 is made double, i. e., composed of two spaced

reversely arranged components 71 and 131, both of irregular L-cross section with oppositely directed horizontal flanges 71a and 131a, and upward flanges 71b and 131b, and with longitudinal recesses 73, 133 at the regions of the junctures between said horizontal and vertical flanges. Also as in the first embodiment, the jamb rails 132 are of irregular T-cross section with oppositely directed lateral flanges 132a to lap the face plates 113 and 116 on the posts 111, 112 of the car body, and with inward flanges 132c for engagement by the outer sash 70. The bottom or sill rail 134 of adapter frame 130, in this instance, completely covers the top of the sill supporting member 118 of the window opening 110 and is cross sectionally configured in conformity with the latter (see Fig. IX), the bevel at 121 being considerably broader than the bevel 21 in Figs. IV and V, so that the corresponding drain bevel 134x of the rail 134 may serve for both the sashes 70 and 152. Also, as shown in Fig. IX, the forward edge of the sill rail 134 of the frame 130 slightly overlaps the juncture plane between the vertical face of the sill member 118 and the abutting face of the external wooden sill bar 122. At 134y, the rail 134 of the frame 130 is formed with an upward flange which is overlapped by the inner sash 152 when the latter is in the closed position of Fig. IX, and which, with the horizontal portion 134a of the said rail, forms a seat for the wooden finishing sill strip 142 interiorly of the car. Hollow square section parting strips 75 and 155 suitably secured to the in-sides of the jamb rails 132 of the adapter frame 130 (see Fig. VIII), in conjunction with the inward flanges 132c of said jamb rails, define vertical channels for guidance of the sashes 70 and 152.

For assurance of air-tightness at the sides, the outer sash 70 is provided, see Fig. VIII, with flexible metal weathering strips 76 which are similar to the weathering strips 67 of Fig. III, and which strips have their free edges bent outwardly to engage vertical grooves 77 in the inward flanges 132c of the jamb rails 132 of the adapter frame 130; while the weathering strips 176 on the inner sash 152 bear against the parting strips 155. At their tops, the sashes 70 and 152 are fitted with folded weather strips 78 and 154 whereof the extended looped portions lap the sloping portions of the head rail components 71 and 131 of the adapter frame 130 occasioned by the recessing at 73 and 133 as shown in Fig. IX. The bottom of the outer sash 70 has a yielding weathering strip 79 of rubber or the like which is adapted to bear against the sill rail 134 of the adapter frame 130, and which is formed with an outward flap 79a capable of shedding rain water. The weathering strip 166 at the bottom of the inner sash 152 is like the strip 79 except for omission of a flap.

The followers 160 for the curtain or shade 150 are in this instance guided in grooves afforded by angle flanges 75a of the parting strips 75 (see Figs. VIII and IX); and the curtain roller is concealed within the hollow of a finishing molding 162 which closely resembles the molding 62 of Fig. V.

In the case of the double sash window construction, it will be noted that the upward flange 131b of the head rail 131 of the adapted frame 130, is secured to the face plate 128 of the car body by rivets 128a, whereas the side flanges 132a of the jamb rails 132 are left unattached, although if desired, they may be riveted fast like the flanges 32a of the first described embodiment.

In order to avoid repetitive description, the parts not specifically referred to in connection with Figs. VII-X have been identified by numerals higher in each case by a hundred than those used to designate corresponding parts in the first described single sash window embodiment of my invention.

From the foregoing it will be seen that the double sash window form of my invention embodies the same structural characteristics which are novel to the first described single sash form, and which favor the attainment of the several advantages pointed out in the introductory portion of this specification.

Having thus described my invention, I claim:

1. In combination, a car body having a hollow side wall and spaced posts within said side wall setting apart a window opening therein; fixed brackets projecting from the sides of the posts within the window opening; and a window comprising a pre-formed rigid adapter frame fitting the opening in the car body, said frame having its jamb rails secured to the brackets aforesaid, and oppositely-directed lateral flanges on its jamb rails lapping the side edges of the window opening exteriorly of the car body; and a sash within the adapter frame.

2. In combination, a car body having a hollow side wall and spaced posts within said side wall setting apart a window opening thereon; fixed brackets projecting from the sides of the posts within the window opening; and a window comprising a pre-formed rigid adapter frame fitting the opening in the car body, said frame having its jamb rails secured to the brackets aforesaid, and oppositely-directed lateral flanges on the jamb rails lapping and secured to the side edges of the window opening exteriorly of the car body; and a sash within the adapter frame.

3. In combination, a car body having a hollow side wall, and spaced posts within said side wall setting apart a window opening therein; fixed brackets projecting from the sides of the posts within the window opening; and a window comprising a pre-formed rigid adapter frame fitting the opening in the car body, said frame having its head rail underlapping the top edge of the window opening, its bottom rail resting on the sill edge of the window opening, and its jamb rails secured to the brackets within the window opening, and oppositely-directed lateral flanges on the jamb rails lapping the side edges of the window opening exteriorly of the car body; and a sash within the adapter frame.

4. In combination, a metallic car body having a hollow side wall and spaced posts in said side wall to form opposite sides of a window opening; and a window comprising a rigid pre-formed adapter frame fitting the window opening with its head rail underlapping the top edge of said opening, its bottom rail supported on the sill edge of the opening, and oppositely-directed flanges on its jamb rails marginally overlapping the side edges of the opening exteriorly of the car body; fixed brackets extending from the sides of the posts within the window opening whereto the jamb rails of the adapter frame are secured; cover molding finishing off the adapter frame at the inside of the car body also secured to the brackets aforesaid; and a sash within the adapter frame.

5. In combination, a metallic car body having hollow side wall and posts in said side wall to form opposite sides of a window opening; and a window comprising a rigid pre-formed adapter

frame fitting the window opening, said frame having its head rail underlapping the top edge of the window opening, its bottom rail supported on the sill edge of the window opening, and outward attaching flanges on its jamb rails marginally overlapping the side edges of the opening exteriorly of the car body; brackets on the posts aforesaid; and a sash slidable in a groove afforded jointly by inward flanges on the adapter frame and opposing parting strips separately secured to the brackets aforesaid.

6. In combination, a car body having a rectangular opening in the sheathing of its side wall and a portion of such sheathing extending inward at the bottom of said opening to form a beveled sill; and a window comprising a preformed rigid adapter frame fitting the window opening, said frame having an L-section head rail engaging upwardly into the hollow of the side wall with its horizontal flange underlapping an inwardly directed flange, a cap bead formed in the sheathing along the upper edge of the window opening, jamb rails of T-section with oppositely-directed lateral flanges overlapping the side edges of the window opening exteriorly of the car body and with angularly and inwardly directed sash guiding flanges, and an angle section bottom rail with a horizontal flange and a depending flange adapted to rest on the bevel of the sill aforesaid; and a sliding sash bearing against the guide flanges of the adapter frame and having a depending portion along its lower edge overlapping the bottom rail of said adapter frame.

7. A window for metallic car bodies with hollow side walls, comprising a pair of sliding sashes; and a rigid pre-formed adapter frame with integrally-connected top, bottom and side rails, adapted for insertion with a close fit into a conformative opening provided for its reception in the car body with its head rail engaging upward into the hollow of the side wall above the top edge of the window, its bottom rail resting on the sill edge of the window opening, and oppositely-directed lateral flanges on its side rails overlapping the side edges of the window opening exteriorly of the car body; and parting strips secured to the jamb rails within the adapter frame affording, in conjunction with inward angularly directed flanges of said jamb rails, vertical grooves for guidance of the two sliding sashes aforesaid.

8. A window for metallic car bodies with hollow side walls, comprising a pair of sliding sashes; and a rigid pre-formed adapter frame fitting an opening provided for its reception in the car body with its head rail engaging upwardly into the hollow of the side wall above the top edge of the window, its bottom rail resting on the sill edge of the window opening, and oppositely-directed lateral flanges on its side rails overlapping the side edges of the window opening exteriorly of the car body; and parting strips secured to the jamb rails within the adapter frame affording, in conjunction with inward angularly directed flanges of said jamb rails, vertical grooves for guidance of the two sliding sashes aforesaid, and projecting weather strips on the top edges of the sliding sashes adapted to engage sloping shoulders on spaced bar components constituting the head rail of the adapter frame.

9. As a new article of manufacture, a preformed integral adapter frame for metallic windows characterized by a head rail; a sill rail; and one piece jamb rails of T-section, with outwardly directed lateral lap flanges and angularly

directed inward sash guiding flanges, rigidly connecting the aforesaid head and sill rails.

10. As a new article of manufacture, a preformed integral adapter frame for metallic windows characterized by a one piece head rail of angular section with an upright flange and a forwardly directed horizontal flange; a one piece sill rail of angle section with a horizontal flange and a depending frontal flange; and one piece jamb-rails of T-section, with outwardly-directed lateral lap flanges and angularly directed inward sash guiding flanges, rigidly connecting the aforesaid head and sill rails.

11. As a new article of manufacture, an adapter frame for metallic windows characterized by a head rail vertically open between spaced reversely-arranged component one piece bars of irregular L-section; a sloped sill rail; and one piece jamb rails of irregular T-section with outwardly directed lateral lap flanges and angularly directed inward sash guiding flanges, rigidly connecting the aforesaid head and sill rails.

12. A window for metallic car bodies with hollow side walls, comprising a preformed rigid adapter frame having integrally-connected top, bottom and side rails and adapted for insertion with a snug fit into an opening provided for its reception in the side wall of the car body with its top rail engaging upward into the hollow of the side wall above the top edge of the window opening and with oppositely-directed lateral flanges on its side rails marginally lapping the contiguous edges of the window opening exteriorly of the car body; and provisions for retaining a sash within said frame.

13. A window for metallic car bodies with hollow side walls, comprising a preformed rigid adapted frame having integrally connected top, bottom and side rails and adapted for insertion with a snug fit into a conformative opening provided for its reception in the side wall of the car body with its head rail engaging upward into the hollow of the side wall above the top edge of the window opening, its bottom rail resting on the sill of the opening, and oppositely-directed lateral flanges on its side rails marginally lapping the contiguous edges of the window opening exteriorly of the car body; and provisions for retaining a sash within said frame.

14. A window for metallic car bodies with hollow side walls, comprising a preformed rigid adapted frame with integrally-connected top, bottom and side rails, and adapted for insertion with a snug fit into a conformative opening provided for its reception in the side wall of the car body with its top rail engaging upward into the hollow of the side wall above the top edge of the window opening and with oppositely-directed lateral flanges on its side rails marginally overlapping the side edges of the window opening exteriorly of the car body; means securing the head rail and the side rail flanges of the frame to the car body; and provisions for retaining a sash within the frame.

15. In combination, a metallic car body having a hollow side wall and spaced posts in said side wall to form opposite sides of a window opening; and a window comprising a rigid preformed adapter frame fitting the window opening with its head rail engaging upward into the hollow of the side wall above the top edge of said opening, and its bottom rail supported on the sill edge of the opening; fixed brackets extending from the sides of the posts within the window opening whereto the jamb rails of the adapter

frame are secured; cover molding finishing off the adapter frame at the inside of the car body also secured to the brackets aforesaid; and a sash within the adapter frame.

- 5 16. The combination with a metallic car body having a hollow side wall with a window opening through the same, and horizontally spaced posts in said side wall set back with respect to the edges of the opening at opposite sides of the latter, of vertically spaced brackets on the posts extending toward the edges of the opening, and a rigid rectangular sash-fitted adapter frame set into the opening and fastened through its jamb members to said brackets.
- 10 17. The combination with a metallic car body having a hollow side wall with a window opening through the same, and horizontally spaced posts in said side wall set back with respect to the edges of the opening at opposite sides of the latter, of vertically spaced brackets on the posts extending toward the edges of the opening, and a rigid rectangular sash-fitted adapter frame set
- 15 20 into the opening and fastened through its jamb members to said brackets, said frame resting on the lower edge of the opening with a portion of the top of the frame projecting outwardly beneath the upper edge of the opening.
- 25 18. The combination with a metallic car body having a hollow side wall with a window opening through the same, and horizontally spaced posts in said side wall set back with respect to the edges of the opening at opposite sides of the latter, of vertically spaced brackets on the posts extending toward the edges of the opening, and a rigid rectangular sash-fitted adapter frame set into the opening and fastened through its jamb members to said brackets, said frame resting on the lower edge of the opening with a portion of the top of the frame projecting outwardly beneath the upper edge of the opening and with another portion of the top of the frame projecting upwardly and outwardly behind said upper edge to form an inclined header.
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