

April 19, 1938.

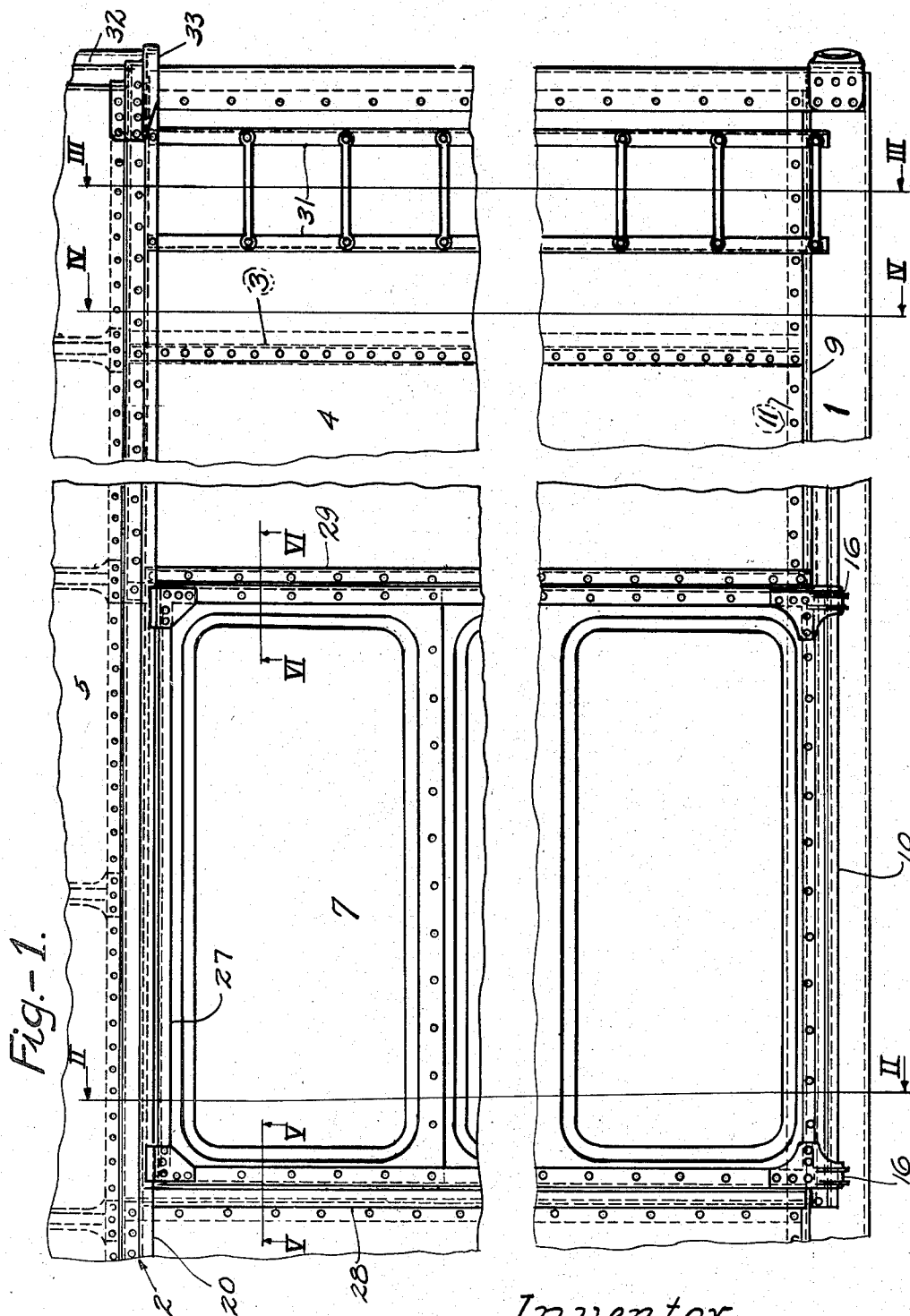
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2,114,754

RAILWAY CAR STRUCTURE

Filed Oct. 19, 1933

3 Sheets-Sheet 1



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RAILWAY CAR STRUCTURE

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3 Sheets-Sheet 2

Fig.-2-

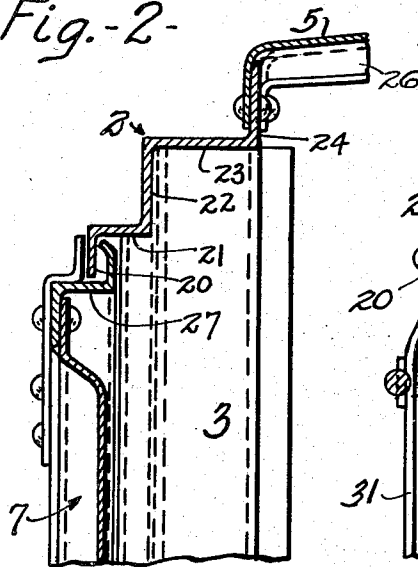


Fig.-3-

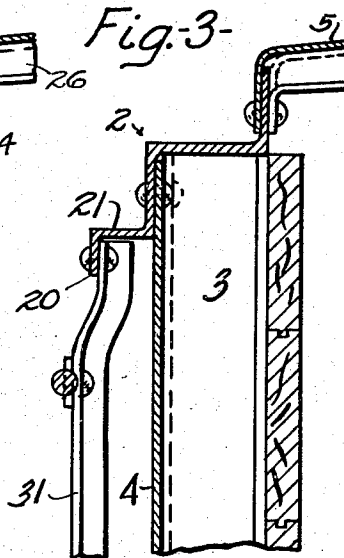


Fig.-4-

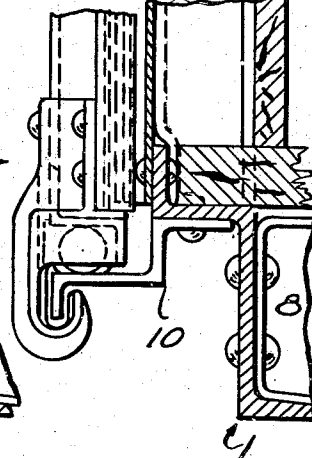
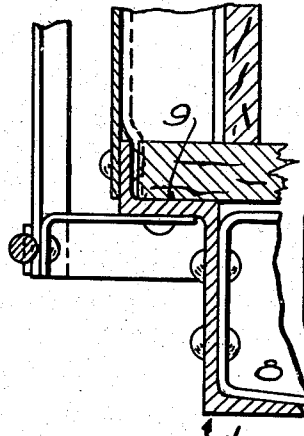
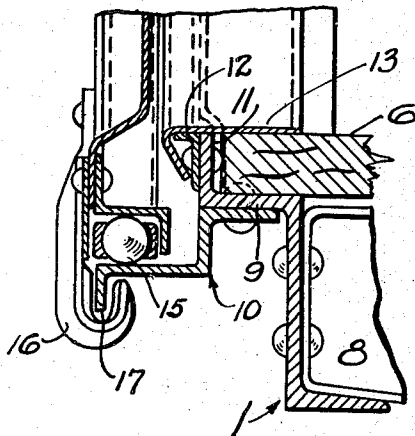
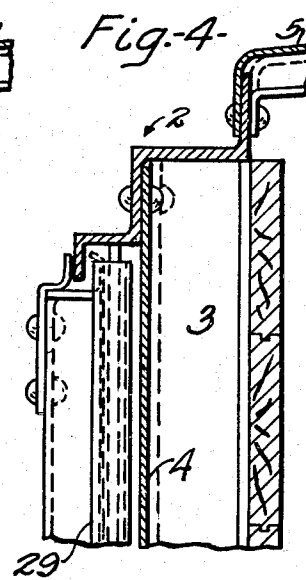


Fig.-5-

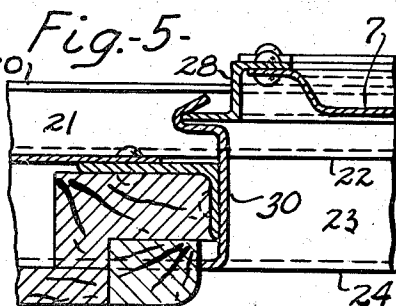
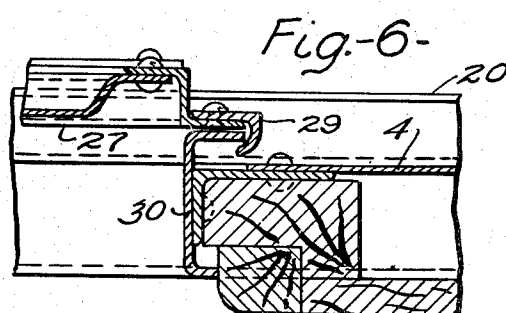


Fig.-6-



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3 Sheets-Sheet 3

Fig.-7-

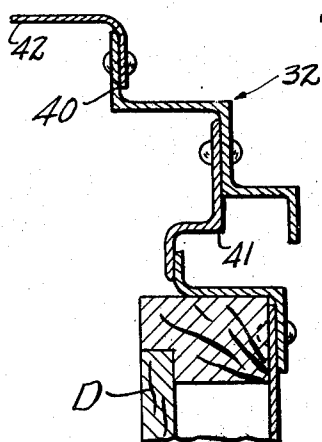


Fig.-8-

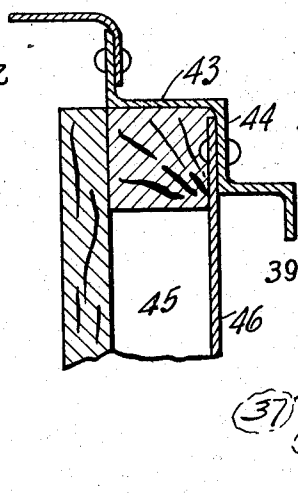


Fig.-9-

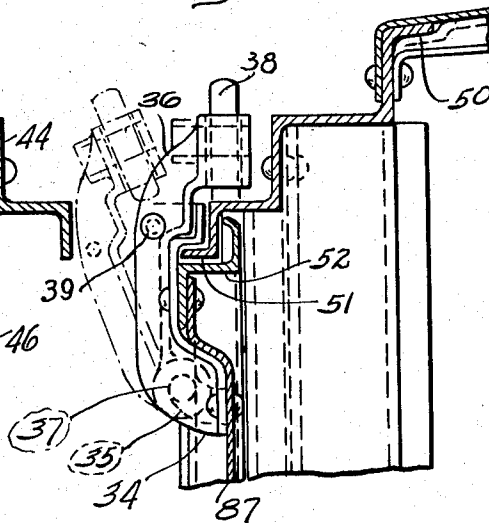


Fig.-10-

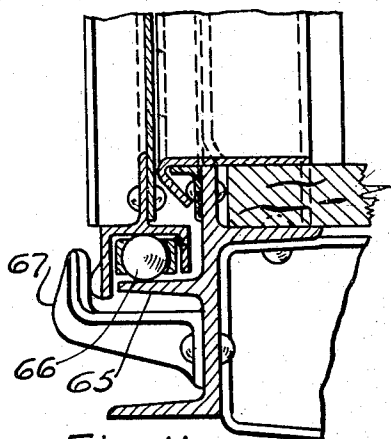
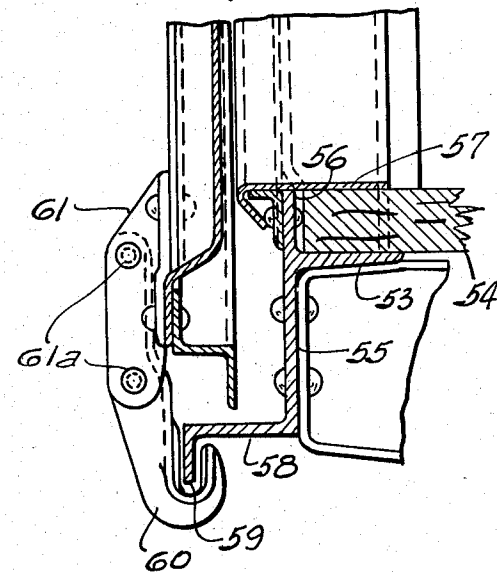
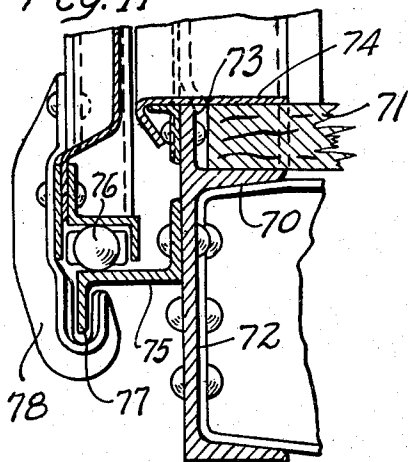


Fig.-11-



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UNITED STATES PATENT OFFICE

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RAILWAY CAR STRUCTURE

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23 Claims. (Cl. 105-409)

The invention relates to railway rolling stock and more particularly to framing and associated wall and door structure in house type cars.

The invention consists in novel sill and side plate members and in the combination therewith of other framing members and non-framing equipment.

The general objects of the invention are to provide maximum strength with a given weight of material, to improve protection against weather at the corners between the car sides and the sill and plate and at the door, and to simplify the mounting of the floor, car wall, door and roof on the sill and plate.

Other detail objects will be referred to in the description of the structure illustrated in the accompanying drawings, in which—

Figure 1 is a partial side view of a railway box car.

Figures 2, 3 and 4 are vertical transverse sections on the section lines II—II, III—III and IV—IV of Figure 1.

Figures 5 and 6 are transverse horizontal sections on the section lines V—V and VI—VI of Figure 1.

Figures 7 and 8 are transverse sections through the end plate of the car.

Figure 9 is a vertical transverse section corresponding to Figure 2 but illustrating another form of the invention.

Figure 10 is a detail cross-section through a modified sill structure.

Figure 11 is a detail cross-section through another modified sill structure.

The structure illustrated in Figures 1 to 8 includes a side sill 1, a side plate 2, upright posts 3 and wall sheets 4, roof sheets 5, a floor 6 and a sliding door 7. This structure is carried upon bolsters and center sills (not shown) in the usual manner, and it will be understood that the car side structure illustrated is intended to carry a substantial portion of the car load between the bolsters irrespective of the transfer of a part of the load on the car side to the center sill by means of the transoms 8.

The side sill member 1 is substantially W-shape in cross section, the upper horizontal flange 9 forming a support for the floor 6. The upper vertical rib 11 of the sill projects upwardly and cooperates with a relatively short angle 12 riveted thereto to form a support for a threshold plate 13 overlying angle 12, rib 11 and floor 6.

Another W-shaped member 10 extends throughout a portion of the length of the side sill and forms a reinforcement therefor and also

forms a track for the door supporting ball 15. The door bracket 16 has a hook at its lower portion which cooperates with the depending lip 17 on member 10 to retain the lower portion of the door in position.

The side plate member 2 preferably consists of a rolled structural steel member of constant cross section substantially from end to end of the car and comprising in cross section a series of vertical and horizontal elements 20, 21, 22, 23 and 24. This member may be considered of "double" Z section with the element 22 comprising the upper flange of the lower Z and the lower flange of the upper Z. The roof carlines 26 and roof sheets 5 are secured at their outer ends to the element 24 of the side plate, the roof sheets 5 extending over element 24 and overlying its outer face.

Side plate elements 22 and 23 form a downwardly and inwardly facing angular pocket which receives the upper ends of the posts 3 and the wall sheets 4, the same being riveted to the upright element 22. This pocket in the side plate is opposed to and in vertical alinement with a pocket formed by the side sill flange 9 and rib 11 which receives the lower end of the posts.

The side plate elements 20 and 21 form a downwardly and inwardly extending pocket receiving and positioning the top edging 27 of the door 7 and also receiving the upper inner portions of the door front and rear edgings 28 and 29 (Figures 5 and 6) and also receiving the outwardly projecting portions of the door post plates 30. Elements 20 and 21 retain the upper end of the door and cooperate with the door edgings 27, 28 and 29 and the post plates 30 to form a satisfactory weather seal around the upper portion of the door opening.

Side plate elements 20 and 21 also form a suitable receiving and mounting structure for the upper ends of the ladder stiles 31 (Figures 1 and 3), providing a secure mounting for the same without the necessity of adding brackets or other additional connections to the side sheet or side plate. The side plate structure described is continued across the end of the car (Figures 7 and 8) although the side and end plates 2 and 32 may be of separate pieces secured together by suitable connection 33 (Figure 1).

The upper elements 40 of the end plate mount the end roof sheets 42 similarly to the mounting of the roof sheets on the side plate. The members 43 and 44 of the end plate form a pocket for receiving the upper ends of the end posts 45 and end sheets 46 similarly to the mounting of these

posts in the side plate and a retainer 41 for an end door D may depend from the end plate.

In the modified structure illustrated in Figure 9, the side plate includes an additional upper horizontal flange 50 and an additional lower flange 51. The upper flange stiffens and supports the edge of the roof sheets and the flange 51, with door edging 52, provides additional weather excluding seal area.

This figure also illustrates a modified sill having a general Z shape, the upper flange 53 supporting the floor 54 and the web 55 having an upper extension 56 which mounts the threshold plate 57 similarly to the extension 11 described in connection with the previous sill structure. The sill is of constant cross section from end to end of the car and its lower flange 58 has a depending lip 59 which serves to engage the lower member 60 of the door bracket, the upper member 61 of which is riveted to the door. The two parts 60 and 61 are riveted to each other at 61a after the door has been applied to the car.

The door is supported by a top hanger which consists of two parts having a sliding and pivotal joint. The lower part 34 is secured to the upper portion of the door 37 and includes elongated slots 35. The upper member 36 is provided with trunnions 37 inserted in slots 35 before the bracket is applied to the door.

Where the side plate and the sill run continuously the full length of the car, the door can only be applied to the sill and plate from the side thereof and it cannot be applied from the end of its track as is possible with the structure shown in Figures 1 and 2 in which the door supporting track 10 is relatively short. By making the door hanger or door bracket, or both, in two pieces as described, the application of the door is facilitated. Upon removal of the pin 39, the hanger part 36 may be moved relative to hanger part 34 until trunnion 37 is at the upper end of the slot 35. This will permit the door to be placed in the position shown, and thereafter the roller 38 may be swung over the track, the door raised sufficiently to permit trunnion 37 to be moved to the lower end of slot 35 to support the door in raised position. The pin 39 may then be reinserted to maintain the two bracket parts rigidly assembled in door operating position.

The sill illustrated in Figure 10 corresponds generally to that shown in Figure 9 but includes an additional horizontal member 65 forming an elevated track for the door carrying ball 66 and the lower edging and ball track on the door are retained in position by a bracket 67 which is riveted to the web of the sill.

The sill in Figure 11 has a general channel shape, its upper flange 70 supporting the floor 71 and its web 72 having an upward extension 73 which mounts the threshold plate 74 similarly to the extensions 11 and 56 described previously. A relatively short Z bar 75 is riveted to the web 72 throughout the length of the door opening and travel and forms a track for the door rollers 76. The depending flange 77 or Z bar 75 engages the door retainer 78.

Any of the different sills may be combined with either of the side plates and in any construction embodying the features described the cornice plate constitutes a strong upper chord member of the side framing to which the roof sheets, carlines, side sheets, side posts and side ladder may be secured without any additional brackets and avoids roof eaves and greatly improves the ap-

pearance of the car. The securing of the roof sheets, carlines and ladder avoids any riveting or welding to the side sheets. The lower portions of the side plate form a retainer for the side door and, in Figure 9, a track for the door hanger. The double Z section facilitates the assembly of the roof, posts, side wall and door and forms an exceptionally rigid member for its weight. The use of the side plate structure of Figure 9 eliminates additional door track and track brackets.

Similarly each of the sill structures described constitutes a strong lower chord member of the car framing and avoids the necessity of applying to the sill one or more members generally used for mounting the car floor. The sill of Figure 10 avoids an additional track member.

Opposing pocket-forming members on the sill and plate cooperate to provide for the assembly therewith of side sheets and posts of simple structure and of minimum length since the lower portions of these members need not extend throughout the depth of the side sill as is customary, but may terminate at the bottom of the floor. The sill structure omits the necessity of coping the sill at the door opening and the provision of additional reinforcing members which is a common expedient. The threshold mounting door edging and plate structure constitute simple effective weather seal structure without the use of non-framing parts which are generally required.

These and other advantages of the structures described may attend the use of variations in the sections other than those illustrated and I contemplate the exclusive use of such modifications as come within the scope of the claims.

I claim:

1. In a railway car structure, a rolled structural steel side sill including a main vertical web and a horizontal flange, a floor supported on said flange, a rib forming an integral part of said sill and extending upwardly beyond said flange, a door threshold plate above said floor, carried on said rib, a member forming an integral part of said sill and extending outwardly from said web, and a door movably supported on said latter-mentioned member.

2. In a railway car structure, a side plate of substantially uniform cross-section substantially from end to end of the car with its cross-section forming a plurality of inwardly and downwardly facing continuous angular pockets extending substantially throughout the length of the plate, body door posts having their upper ends for substantially their entire depth seated in one of said pockets, and a sliding door having its upper end housed in another of said pockets.

3. In a railway car structure, a side plate having a cross-section substantially uniform substantially throughout the length of the car and forming a plurality of inwardly and downwardly facing angular pockets, a body wall and a post seated bodily in the inner of said pockets, and sliding door structure including top and side angular framing elements enclosed in part by the outer of said angular pockets.

4. In a railway car structure, a side plate of substantially uniform cross-section substantially from end to end of the car and comprising in part an angle shape with its legs disposed downwardly and inwardly respectively, a body post positioned bodily on the inner side of and secured to said downwardly disposed leg, said plate including a flange extending outwardly and then downwardly from said downwardly disposed leg

and forming a door retaining member throughout a portion of its length.

5. A structure as specified in claim 4 in which the plate also includes a flange extending upwardly from the inwardly disposed leg, and roof structure supported by said latter-mentioned flange.

6. A structure as specified in claim 4 in which the plate also includes a flange extending upwardly from the inwardly disposed leg, and roof structure supported by said latter-mentioned flange, said plate parts comprising a single rolled structural member.

7. In a railway car structure of the house type, a side plate of constant cross-section substantially from end to end of the car and including an inwardly and downwardly facing angular portion forming a pocket for the car wall and posts, a member projecting outwardly from said portion, a lip depending from the outer edge of said member, and a ladder having its rails secured to said lip.

8. In a railway car structure, a side plate being of double Z bar cross-section substantially from end to end of the car, the outer flanges of which section form roof mounting and door retaining elements respectively, and the intermediate flanges of which section form an inwardly extending pocket for receiving the upper portion of a post body and a car side wall.

9. In a railway car structure, a rolled structural steel side plate having a constant cross-section substantially from end to end of the car and comprising a series of horizontal and vertical members, carlines having their ends secured to the upper vertical member of said side plate, a roof sheet resting on said carlines and secured to the outer face of said vertical member, side posts and sheets secured to an intermediate vertical member of said side plate, and non-framing equipment positioned by the lower members of said side plate.

10. In a railway car structure, a rolled structural steel side plate having a constant cross-section substantially from end to end of the car and comprising a series of horizontal and vertical members, carlines and roof sheets secured to the upper vertical member of said side plate, side posts and side sheets secured to an intermediate member of said side plate, and a door with a hanger having a supporting roller mounted on the lower horizontal member of said side plate.

11. In a railway car structure, a rolled structural steel side plate having a constant cross-section substantially from end to end of the car and comprising a series of horizontal and vertical members, carlines and roof sheets secured to the upper vertical member of said side plate, side posts and side sheets secured to an intermediate member of said cornice plate, and a side door having its upper end located inside of and retained by the lower vertical member of said side plate and located outside of and under the vertical intermediate member of said side plate.

12. A railway car rolled structural steel side plate of constant cross-section substantially from end to end of the car and comprising an upper vertical member, a horizontal member extending outwardly from the lower edge thereof, a vertical member extending downwardly from the outer edge of said horizontal member, a horizontal member extending outwardly from the lower edge of said latter-mentioned vertical member, and a vertical member extending downwardly from the

outer edge of said latter-mentioned horizontal member.

13. In a railway car, a side plate including an outwardly extending horizontal flange and a depending lip at the outer edge thereof, a door having its upper end housed in the angle between said flange and lip and retained by the latter, a bracket secured to said door, a door hanger having a pivot element at one end and slidably and pivotally connected to said bracket and having a roller element at the other end movable about said pivot element, when the latter is at one end of its sliding movement, into position to ride on said horizontal flange, and detachable means for securing said hanger to said bracket when said pivot is at the other end of said sliding movement whereby said roller is retained in functioning position.

14. A railway car rolled structural steel side plate in the form of a double Z bar section of constant cross-section from end to end with the webs of the Z sections being disposed horizontally and the downwardly turned flange of the upper Z bar forming the upwardly turned flange of the lower Z bar, said flange and one of said webs forming a pocket for bodily receiving a car side post.

15. A railway car metal side plate in the form of a rolled structural steel double Z bar section from end to end with the upper member of the lower Z bar and the lower member of the upper Z bar cooperating to form an inwardly and downwardly facing pocket for receiving car wall and post structure, said Z bar sections including other elements projecting outwardly and upwardly from said pocket for receiving a sliding door and mounting a roof sheet respectively.

16. In a railway car structure, a side sill and a side plate each being a rolled structural shape of W section, said side sill forming pockets facing inwardly and upwardly of the car and said side plate forming pockets facing inwardly and downwardly of the car, side framing structure of substantially uniform thickness from top to bottom extending between said side sill and plate and being mounted bodily in opposing angular pockets formed thereby and sliding door structure correlated with other opposing pockets formed by said W sections.

17. A structure as specified in claim 16 which also includes a floor supported directly upon an element of said side sill, and a roof supported directly upon an element of said side plate.

18. A car side sill comprising a structural steel rolled member having a general Z shape cross-section substantially from end to end, there being an upstanding threshold supporting extension of its web projecting above its upper flange and there being a door supporting lateral rib projecting from its web intermediate its flanges.

19. A railway car structure comprising a side sill member, a side plate member of uniform cross section substantially from end to end, side posts and a side door, said members having vertical and horizontal elements forming opposing vertically aligned angular pockets for receiving lower and upper portions of said posts respectively, means securing the post end portions to the inner faces of said vertical elements, and structure forming an integral part of said side plate member and projecting outwardly from said post receiving pockets substantially throughout the length of said side plate member to reinforce the same and to form a door retainer.

20. In a railway car structure, a side plate of substantially uniform cross-section from end to end of the car and comprising in part an angle shape with its legs disposed downwardly and inwardly respectively, a body post positioned on the inner side of and secured to said downwardly disposed leg, said plate including a flange extending outwardly and then downwardly from said downwardly disposed leg and forming an outer pocket, a sliding door correlated with said plate, said post and door having cooperating interlocking elements forming weather seal structures at the front and rear edges of said door, the upper ends of said seal structures terminating within said outer pocket.

21. A railway car structure comprising a rolled structural steel side sill member of uniform cross section substantially from end to end of the car, a rolled structural steel side plate member of uniform cross section substantially from end to end of the car, side posts, and a side door, said members having vertical and hor-

izontal flanges forming opposing vertically aligned angular pockets for receiving lower and upper portions of said posts, respectively, there being a continuous integral element of said sill member extending outwardly beyond the horizontal flange of said sill member to support and retain the lower portion of said door and an integral element of said plate member extending outwardly and downwardly beyond the vertical flange of said plate member to form a housing for receiving and retaining the upper portion of said door.

22. A structure as specified in claim 4 in which the plate also includes a part extending upwardly and inwardly from the inwardly disposed leg, and roof structure supported by said part.

23. A railway car side plate as described in claim 12 which also includes a horizontal flange along the upper vertical member to form an extended support for the car roof.

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