Sept. 14, 1937. F. DITCHFIELD 2,092,959

CAR SIDE CONSTRUCTION

Filed Oct. 30, 1935 3 Sheets-Sheet 1

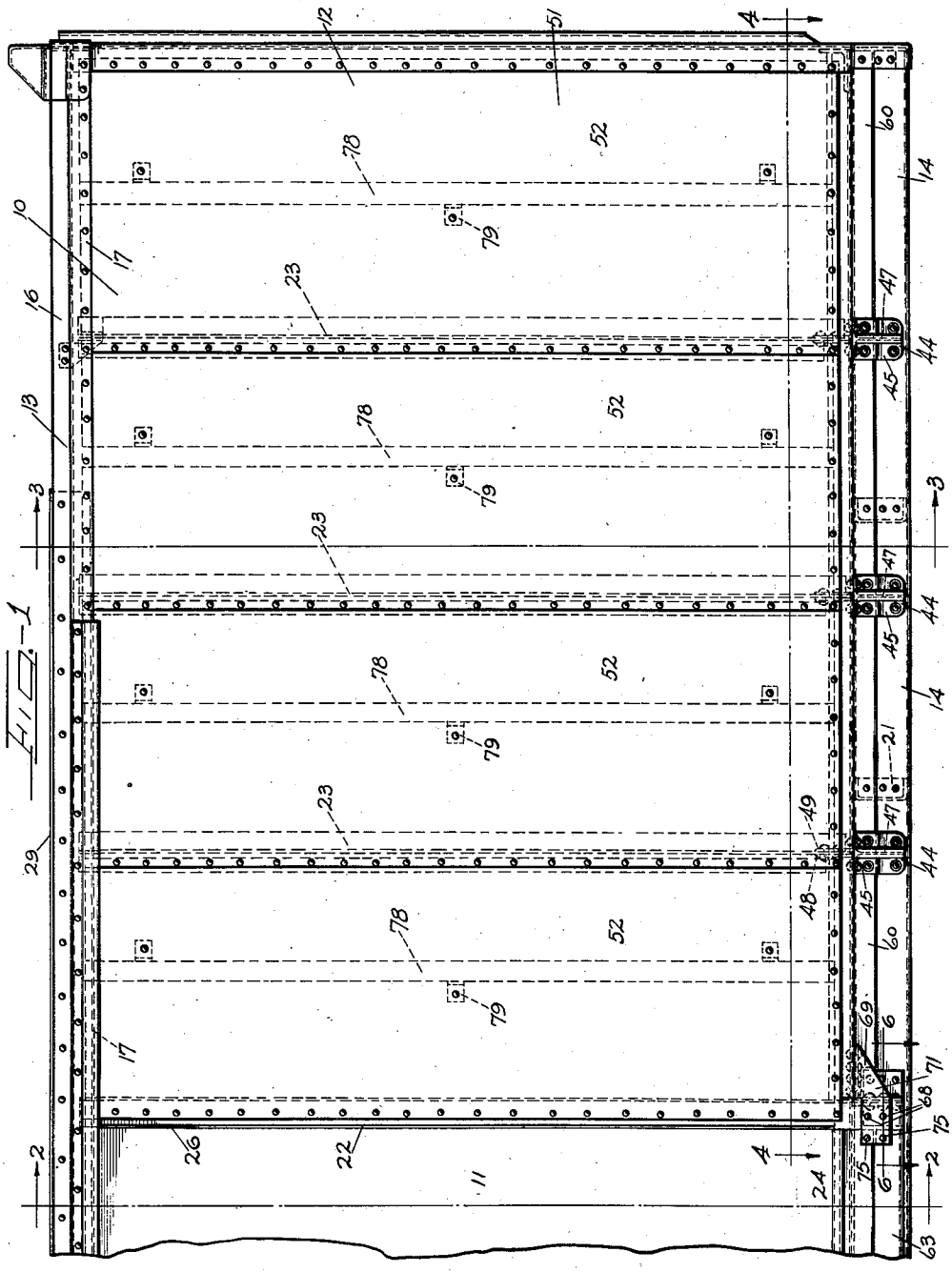


FIG. 1

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Filed Oct. 30, 1935 3 Sheets-Sheet 2

FIG. 2

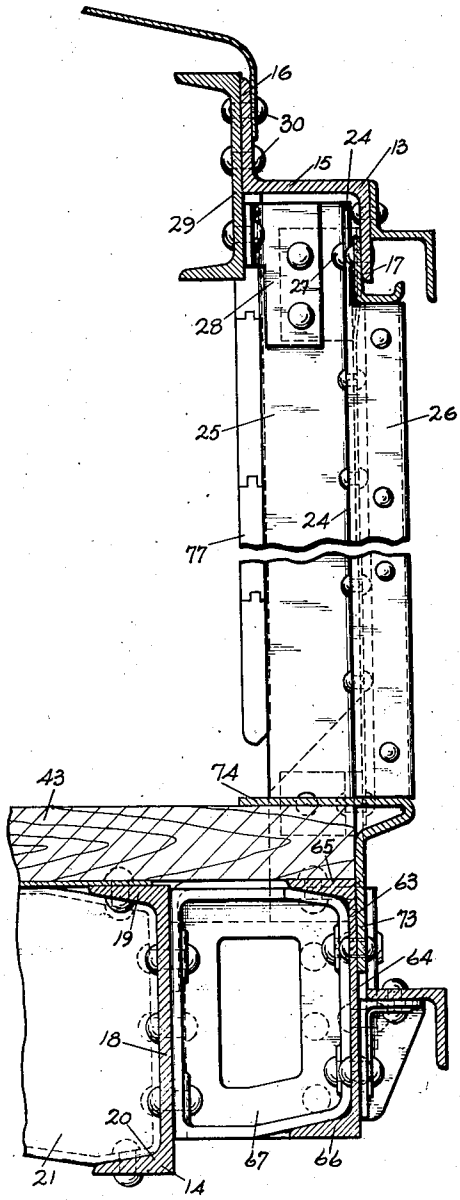
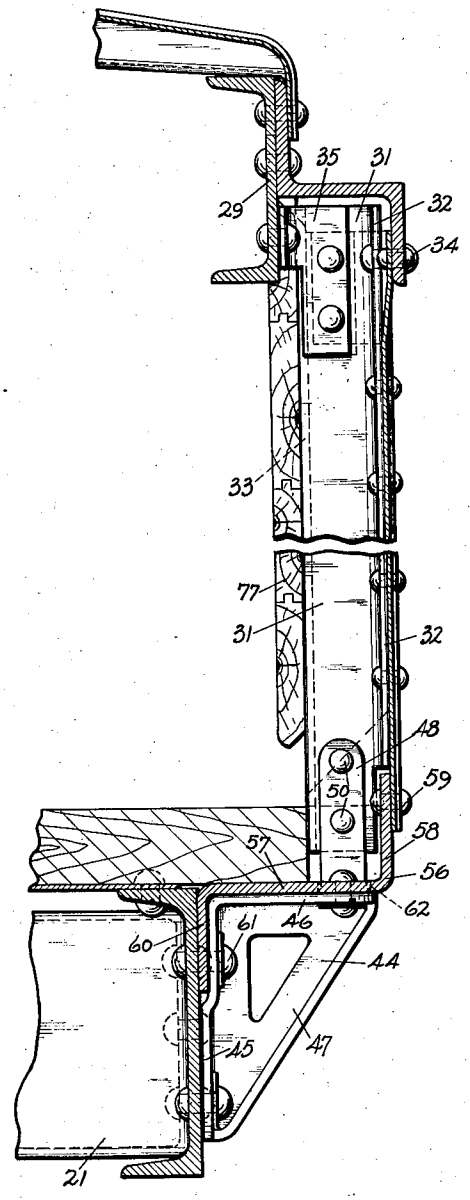


FIG. 3



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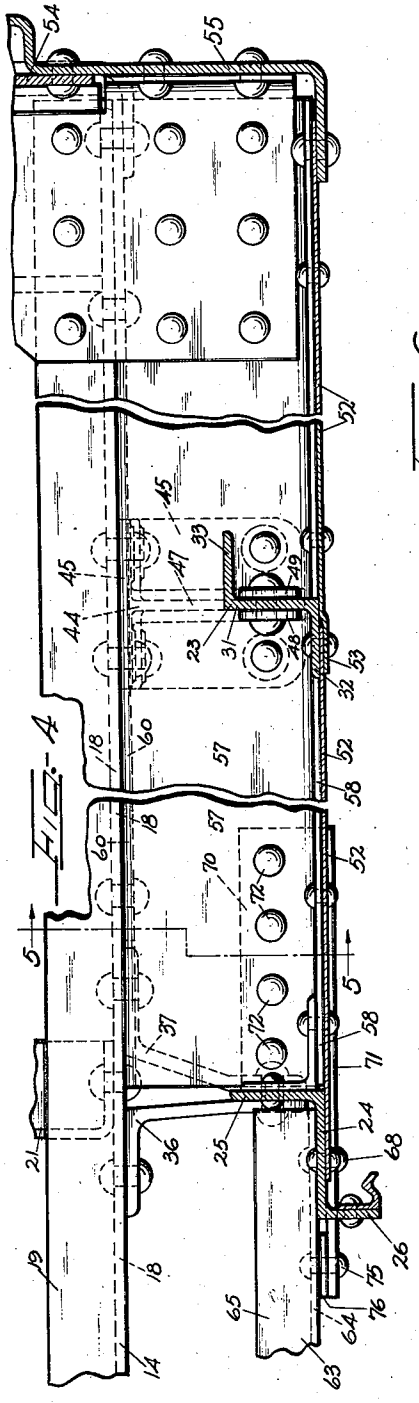


FIG. 4

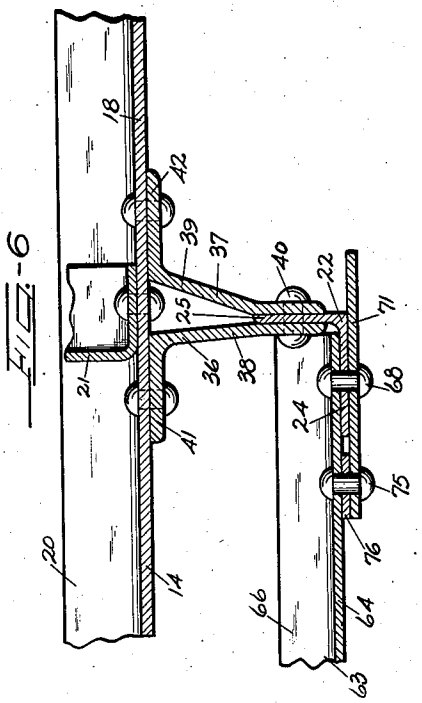


FIG. 6

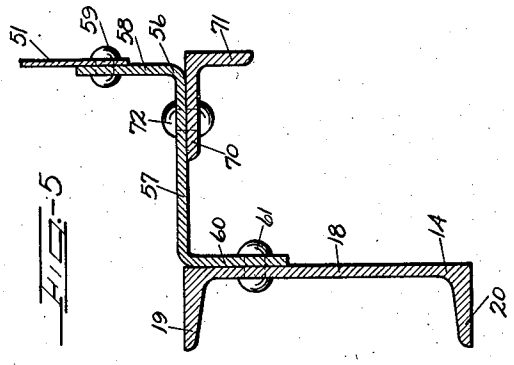


FIG. 5

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UNITED STATES PATENT OFFICE

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CAR SIDE CONSTRUCTION

Frank Ditchfield, Cleveland, Ohio, assignor to The Youngstown Steel Door Company, Cleveland, Ohio, a corporation of Ohio

Application October 30, 1935, Serial No. 47,466

8 Claims. (Cl. 105—404)

This invention relates to improvements in "car side construction".

A recent development in railway house car conversion or repair has enabled the railroads to convert wooden sheathed cars possessing serviceable metallic underframes to metallic house cars and to reap the substantial benefits of economy of repair, increased life of the cars, enlarged capacity and enhanced revenue yield attendant upon such conversion. The metallic car side construction by which these benefits are made possible embodies angular members secured to and along the lower margin of the metallic sheathing of the converted cars and extending therefrom and secured to the side sill of the underframe of the car. These angular members have, in the past, uniformly extended from a door post which extends below the top of the side sill to the adjacent end of the car and thus have been incapable of entering into the construction of the side wall girder as a part of the lower cord of said girder or as a reinforcement therefor. The side wall girder of the converted metallic house car is constituted by the side sill at the bottom, the side plate at the top and the connecting door and intermediate posts secured to the side sill and side plate.

The instant invention is particularly efficacious in its application to the conversion of a box car to an automobile car. The door opening provided in each side of a box car is approximately 6' wide and is controlled by a single sliding door. In an automobile car this opening is 12' or more in width and is controlled by two oppositely sliding doors. Hence, to effect the conversion from a box car to an automobile car and to obtain the necessary wide door opening, it is required that one intermediate post be removed. Inasmuch as the posts constitute the tension members of the side wall girder hereinabove defined, a removal of one of said posts decreases in proportionate amount the support of the side sill, the bottom cord of said girder, against deflection. The instant invention permits the indicated conversion while providing for a reinforcement of the bottom cord and a maintenance of the desired rigidity or strength thereof.

It is, therefore, the primary object of this invention to provide a car side construction for railway house cars in which the metallic member connecting the metallic sheathing of said side and the side sill shall be incorporated as an integral part of the lower cord of the side wall girder or constitute a reinforcement for the side sill from end to end thereof.

A further object is to provide a car side construction in which the member connecting the metallic sheathing of said side and the side sill shall be incorporated as an integral part of the entire lower cord of the side wall girder and which construction shall provide for the support of the flooring in the door opening projecting beyond the side sill.

A further object is to provide a novel construction for supporting that part of the car floor which is in the door opening and overhangs the side sill.

Other objects of the invention will become clear as the description thereof proceeds.

In the drawings forming part of this specification—

Figure 1 is an elevation of a portion of a railway house car showing a part of the car side wall thereof from the door opening to the adjacent end of the car embodying the invention.

Figure 2 is a vertical section taken on line 2—2 of Figure 1.

Figure 3 is a vertical section taken on line 3—3 of Figure 1.

Figure 4 is a horizontal section taken on line 4—4 of Figure 1, the floor of the car being omitted to more clearly illustrate the invention.

Figure 5 is a horizontal section taken on line 5—5 of Figure 4.

Figure 6 is a horizontal section taken on line 6—6 of Figure 1.

Referring to the drawings, there is illustrated a portion of a railway house car 10 which may be considered as representing a house car of the automobile type converted from an originally wooden sheathed box car or a new house car construction of either the box car or automobile type. The drawings illustrate a portion of the side wall construction of the car extending from and including a part of the door opening 11 to and including the adjacent end of the car. It is to be understood that the remaining portion of the car side wall construction is complementary to that illustrated and that the side wall construction on the opposite side of the car will be similar to that shown.

The portion of the side wall construction illustrated is indicated generally by the reference numeral 12 and embodies a side plate 13 extending along the top of the side wall and a side sill 14 extending along the bottom of the wall. The side plate 13 is preferably formed of a Z-bar arranged with its web 15 extending substantially horizontally and its inner and outer vertically disposed legs 16 and 17 positioned vertically. The side sill 14 is shown as a channel shaped member

having its web 18 arranged vertically and its upper and lower flanges 19 and 20 extending inwardly. The side sill 14 is fastened preferably by means of rivets to the cross members of the car underframe, one of said members being indicated at 21.

The side plate and side sill are connected by means of vertical posts extending between these members. One of these posts is the door post 22 which, together with a similar opposed door post, defines the width of the door opening 11. The remaining posts designated by the numeral 23 are the intermediate posts. As clearly appears from Figures 1 and 2 of the drawings, the door post 22 extends downwardly below the top of the side sill whereas the intermediate posts 23 terminate preferably above the side sill 14. As best shown in Figures 3 and 4 of the drawings, the door and intermediate posts are preferably disposed in outwardly spaced relationship to the side sill 14 in order to obtain a desired increase in the inside width of the car. The preferred securement of the upper ends of the posts to the side plate is illustrated in Figures 2 and 3 of the drawings. The door post 22, which is preferably of Z-section, is arranged with its web 24 parallel to the car side wall and its oppositely extending legs 25 and 26 lie at substantially a right angle to the side wall. The web 24 of the door post 22 is secured to the vertical depending leg 17 of the side plate as by means of rivets 27. The inwardly directed leg 25 of the door post is secured by means of an angle clip 28 to a channel-shaped reinforcing member 29 riveted to the upstanding leg 16 of the side plate, as indicated at 30.

Each of the intermediate door posts 23 is disposed with its web 31 extending at right angles to the car side wall and with its oppositely extending legs 32 and 33 arranged parallel to said wall. The securement of the upper end of each of the intermediate door posts to the side plate is obtained by means of rivets 34 extending through the depending leg 17 of the side plate and the leg 32 of the post. The upper end of each of the intermediate posts is additionally fastened to the side plate by means of an angle clip 35 secured to the web 31 of the post and to the web of the channel-shaped reinforcing member 29 for the side plate.

At its lower end, each of the door posts 22 is secured to the side sill 14 by means of a pair of angle members 36 and 37. Each of these angle members is provided with a leg 38 and 39 respectively disposed upon opposite sides of the inwardly extending leg 25 of the door post and secured thereto as by means of rivets 40. The legs 38 and 39 diverge inwardly from the door post to the respective legs 41 and 42 of the angle members 36 and 37, the latter legs being secured to the web 18 of the side sill. It will be observed from a consideration of Figures 1 and 2 of the drawings that the outwardly extending leg 26 of the door post 22 terminates substantially in the upper plane of the car floor 43.

The securement of the lower ends of each of the intermediate posts 23 to the side sill is effected by means of a bracket preferably in the form of a casting and designated by the numeral 44. Each of the brackets 44 is provided with a vertical attaching flange 45 and a horizontal flange 46 connected by means of an intermediate web 47. From the horizontal flange 46 there extends upwardly a pair of spaced attaching flanges 48 and 49 disposed upon opposite sides of the web 31 of each of the intermediate posts. These attaching flanges may be secured to the web of each post by means of rivets, as indicated at 50.

The side wall construction embodies additionally metallic sheathing 51 which extends from the door post 22 to the adjacent end of the car. The metallic sheathing 51 is preferably formed of a plurality of metallic sheets 52. Each of these sheets extends between two adjacent posts and from the side plate to a point above the side sill. The metallic sheets 52 are disposed upon the outside of the posts, adjacent sheets overlapping and being riveted to the intermediate posts as indicated at 53. At the door post the contiguous metallic sheet 52 is riveted to the web of the post. The end sheet of the metallic sheathing is secured to the car end 54 by means of a sturdy angular member 55, as clearly illustrated in Figure 4 of the drawings.

It will be apparent from an inspection of Figure 3 of the drawings that the metallic sheathing 51 is disposed in outwardly spaced relationship to the side sill 14. For the purpose of securing the metallic sheathing to the side sill and for closing the gap between the sheathing and the side sill an angular member 56 preferably in the form of a Z-bar is utilized. The member 56 is arranged with its web 57 in a substantially horizontal plane so as to dispose one leg 58 upwardly for securement to and along the lower margin of the metallic sheathing as indicated at 59. The other leg 60 of the angular member 56 extends downwardly from the web 57 and is secured as by means of rivets 61 to the web 18 of the side sill. The web 57 is provided with openings 62 in order to permit the projection of the bracket attaching flanges 48 and 49 through the angular connecting member 56.

In the construction hereinabove described it will be apparent that there is provided a side wall girder adapted to resist stresses set up by the lading in the car. This side wall girder has for its upper cord the side plate 13 and for its lower cord the side sill 14. The door and intermediate posts 22 and 23 constitute the tension members of the girder, being aided in this function to a small degree by the metallic sheathing 51. It is apparent, however, by virtue of the disposition of the door post, that the metallic connecting Z-members 56 cannot effectively enter into the side wall girder construction inasmuch as their extent is limited from a door post to an adjacent end of the car. These bottom connecting Z-members have, however, by the instant invention, become incorporated into the side wall girder construction so as to effectively serve as a portion of the lower cord of the girder or, in other words, as a reinforcement for the lower cord. Moreover, by the instant invention there is accomplished a reinforcement of the side sill or lower cord of the girder intermediate the door posts whereby said side sill is reinforced not only in its function as a part of the side wall girder, but when considered as a beam across which heavy loadings often in the neighborhood of 15 tons or more are trucked. There is at present, moreover, the further advantage that a sturdy support is provided for that portion of the car floor which overhangs the side sill intermediate the door posts.

For the attainment of these advantages there is utilized a sturdy angular member preferably in the form of a channel 63 arranged with its web 64 disposed vertically and its upper and lower horizontal flanges 65 and 66 directed inwardly. Intermediate the door posts 22 the reinforcing channel member 63 is secured to the

side sill 14 by means of a plurality of spaced brackets 67, each of which, as clearly shown in Figure 2 of the drawings, is preferably in the form of a diaphragm extending between and secured to the webs 18 and 64 of the side sill and the reinforcing channel 63. At its ends the channel member 63 is riveted to the webs 24 of the door posts 22, as indicated at 68.

A direct securement is provided between the adjacent ends of the reinforcing channel member 63 and the bottom connecting Z-bars 56. For this purpose the invention utilizes preferably an angle member 69 having one of its flanges 70 arranged below the web 57 of the bottom connecting Z-bar 56 and its other flange 71 arranged vertically. The horizontal flange 70 is secured to the web 57 as by means of rivets 72, as clearly illustrated in Figures 4 and 5 of the drawings. The vertical flange 71 of the angle connecting member passes in front of the web 24 of the door post 22 and is secured to said web by means of the rivets 68 which, as hereinabove stated, pass through the web 24 of the door post and the web 64 of the channel reinforcing member 63. The vertical flange 71 is additionally secured to the web 64 of the channel reinforcing member and to the depending flange 73 of a threshold plate 74 by means of rivets 75. The lowermost of the rivets 75 pass through a small filler plate 76 interposed between the flange 71 and the web of the channel reinforcing member in order to fill in the gap between these members provided by the disposition of the flange 73 of the threshold plate between the flange 71 and the web of the reinforcing member.

The reinforcing channel member 63, as clearly shown in Figure 2 of the drawings, is arranged so that the upper flange 65 thereof engages the under surface of the floor 43 where said floor projects beyond the side sill 14. The reinforcing member 63, therefore, serves as a support for the overhang of the floor 43.

The car side wall is provided with an inner wooden lining 77 fastened in abutting relationship to the posts by securement to vertical nailing strips 78 fastened to the metallic sheathing by angle clips 79.

It will be apparent that numerous changes and modifications in the details of the invention will be clear to those skilled in the art. It is intended, therefore, that all such modifications and changes be comprehended within this invention, which is to be limited only by the scope of the claims appended hereto.

I claim:

1. A railway house car having a metallic underframe including a metallic side sill, and a side wall, said wall comprising door posts extending downwardly below the top of said side sill and intermediate posts, a side plate, means securing the upper end of each of said posts to said side plate, means securing the lower ends of each of said posts to said side sill, metallic sheathing secured to said side plate and to the outside of said posts in spaced relationship to said side sill and a metallic angular member extending from each door post to the adjacent end of said car, said member extending between and connecting said sheathing to said side sill, a metallic member disposed between said door posts and secured to said side sill and means independent of said side sill securing the adjacent ends of said members together.

2. A railway house car having a metallic underframe including a metallic side sill, and a side wall, said wall comprising door posts extending downwardly below the top of said side sill, and defining the width of a door opening provided in said side wall, intermediate posts, a side plate, means securing the upper end of each of said posts to said side plate, means securing the lower end of each of said posts to said side sill, metallic sheathing secured to said side plate and to the outside of each of said posts, said sheathing lying laterally outwardly of said side sill and a metallic angular member extending from each door post to the adjacent end of the car, said member extending between and connecting said sheathing to said side sill, a metallic member secured to said side sill below said door opening and extending between said door posts, and means other than said side sill securing the adjacent ends of said members together.

3. A railway house car having a metallic underframe including a metallic side sill, and a side wall, said wall comprising door posts extending downwardly below the top of said side sill and intermediate posts, a side plate, means securing the upper end of each of said posts to said side plate, means securing the lower ends of each of said posts to said side sill, metallic sheathing secured to said side plate and to the outside of said posts in spaced relationship to said side sill and a metallic angular member extending from each door post to the adjacent end of said car, said member having a vertical leg secured to and along the lower margin of said sheathing and an inwardly directed portion extending and secured to said side sill, a metallic member extending between said door posts, means securing said latter member to said side sill and means securing the adjacent ends of said angular members and said latter member, each of said means comprising a substantially horizontal flange secured to said inwardly directed portion of an angular member and a vertical flange secured to said member which is disposed between said door posts.

4. A railway house car having a metallic underframe including a metallic side sill, and a side wall, said wall comprising door posts extending downwardly below the top of said side sill and intermediate posts, a side plate, means securing the upper end of each of said posts to said side plate, means securing the lower ends of each of said posts to said side sill, metallic sheathing secured to said side plate and to the outside of said posts in spaced relationship to said side sill and a metallic angular member extending from each door post to the adjacent end of said car, said member having a vertical leg secured to and along the lower margin of said sheathing and an inwardly directed portion extending and secured to said side sill, a metallic member extending between said door posts, means securing said latter member to said side sill and means securing the adjacent ends of said angular members and said latter member, each of said means comprising a substantially horizontal flange secured to said inwardly directed portion of an angular member and a vertical flange secured to said member which is disposed between said door posts, said latter flange being secured to the adjacent door post.

5. A railway house car having a metallic underframe including a metallic side sill, and a side wall, said wall comprising door posts extending downwardly below the top of said side sill, and defining the width of a door opening provided in said side wall, intermediate posts, a side plate, means securing the upper end of each of said

posts to said side plate, means securing the lower end of each of said posts to said side sill, metallic sheathing secured to said side plate and to the outside of each of said posts, said sheathing lying laterally outwardly of said side sill and a metallic angular member extending from each door post to the adjacent end of the car, said member extending between and connecting said sheathing to said side sill, a metallic member secured to said side sill below said door opening and extending between said door posts, said car having a floor projecting outwardly beyond said side sill between said doors posts, said latter metallic member supporting the overhanging portion of said floor and means other than said side sill securing the adjacent ends of said metallic members together.

6. A railway house car having a metallic underframe including a metallic side sill, and a side wall, said wall comprising door posts extending downwardly below the top of said side sill, and defining the width of a door opening provided in said side wall, a metallic reinforcing member for said side sill disposed below said door opening in outwardly spaced relation to said sill, means securing said reinforcing member to said sill, said car having a floor projecting outwardly beyond said sill between said door posts, said member supporting the projecting portion of said floor.

7. A railway house car having a metallic underframe including a metallic side sill, and a side wall, said wall comprising door posts extending downwardly below the top of said side sill, and defining the width of a door opening provided in said side wall, intermediate posts, a side plate, means securing the upper end of each of said posts to said side plate, means securing the lower end of each of said posts to said side sill, metallic sheathing secured to said side plate and to the outside of each of said posts, said sheathing lying laterally outwardly of said side sill and a metallic angular member extending from each door post to the adjacent end of the car, said member extending between and connecting said sheathing to said side sill, a metallic member secured to said side sill below said door opening in laterally outwardly spaced relationship to said sill and extending between said door posts, said car having a floor projecting outwardly beyond said side sill between said door posts, said latter metallic member supporting the overhanging portion of said floor and means securing the adjacent ends of said metallic members together.

8. A railway house car having a metallic underframe including a metallic side sill, and a side wall, said wall comprising door posts extending downwardly below the top of said side sill, and defining the width of a door opening provided in said side wall, intermediate posts, a side plate, means securing the upper end of each of said posts to said side plate, means securing the lower end of each of said posts to said side sill, metallic sheathing secured to said side plate and to the outside of each of said posts, said sheathing lying laterally outwardly of said side sill and a metallic angular member extending from each door post to the adjacent end of the car, said member extending between and connecting said sheathing to said side sill, a channel member disposed below said door opening in laterally outwardly spaced relationship to said sill and arranged with its web vertically and its flanges directed inwardly, brackets extending between said flanges and between and secured to said web and said side sill, said channel member extending from door post to door post, said car having a floor projecting beyond said sill between said door posts, said channel member supporting the projecting portion of said floor, and means securing the ends of said channel member to the adjacent ends of said metallic angular members.

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