

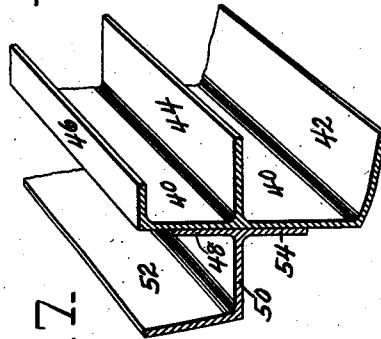
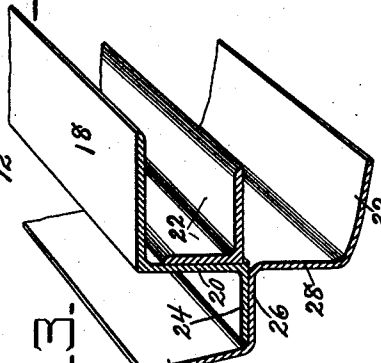
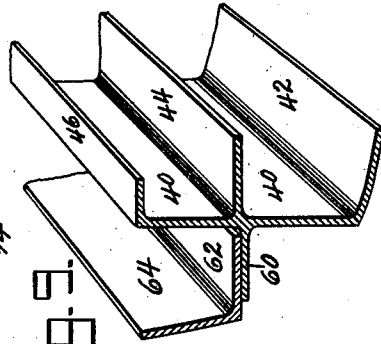
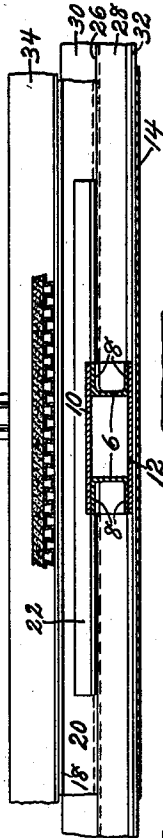
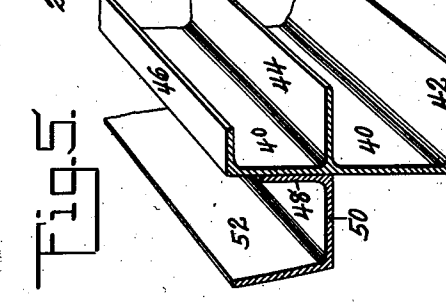
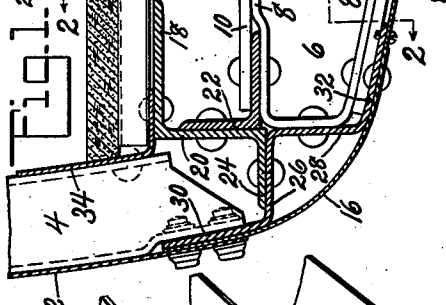
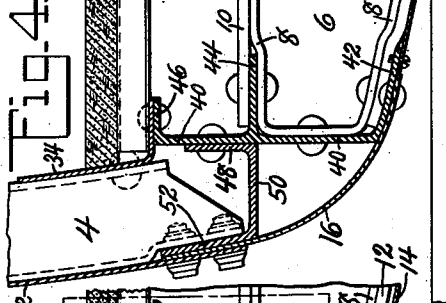
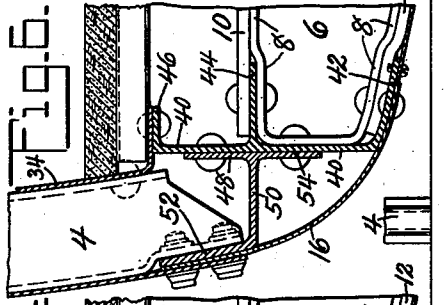
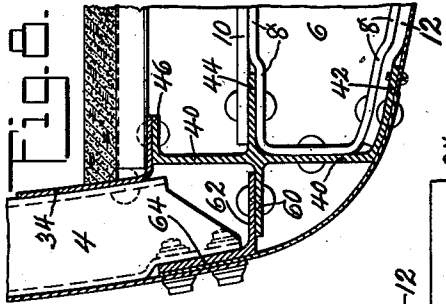
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SIDE SILL

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SIDE SILL

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11 Claims. (Cl. 105—418)

This invention relates to structural members in general and in particular to such members when utilized as side sills for railway cars of the passenger carrying type.

In the majority of railway passenger cars as previously built the side sills have been designed to give maximum strength in a vertical direction without any particular attention being paid to the strength in a horizontal direction. In modern light weight cars the underframe and side wall parts have been reduced in thickness and strength as much as is possible. As a result it is necessary that certain of the component parts be constructed to resist lateral thrusts which may be imparted to the car body. One of the objects, therefore, of the present invention is the provision of a new and improved side sill having substantially the same strength in a lateral as in a vertical direction.

A further object of the invention is the provision of a new and improved side sill which will effectively tie the underframe members together and to the side posts, while at the same time providing the support for the outer edge of the car floor.

These and other objects of the invention will be apparent to persons skilled in the art from a study of the following description and accompanying drawing, in which:

Figure 1 is a sectional view taken through the car and showing the construction immediately adjacent the side sill;

Fig. 2 is a sectional view taken substantially on line 2—2 of Figure 1 and disclosing the construction at the bolsters;

Fig. 3 is a partial perspective view disclosing the form of sill shown in Figs. 1 and 2;

Fig. 4 is a sectional view similar to Figure 1 but showing a slight modification thereof;

Fig. 5 is a partial perspective view of the sill element shown in Fig. 4;

Figs. 6 and 7 are views similar to Figs. 4 and 5 respectively but showing a very slight modification thereof;

Fig. 8 is a sectional view similar to Figs. 1 and 4 but showing a still further modification, and

Fig. 9 is a partial perspective view showing the sill element of Fig. 8.

Referring now to the drawing in detail, it will be seen that the various side sill arrangements have been used in connection with a car of the streamline type having side sheets 2 fastened to posts 4. The exact form of the underframe members is immaterial, but in the present instance the bolster is shown as formed of channel

pressings 6 with the flanges 8 thereof directed outwardly and secured to top and bottom cover plates 10 and 12 respectively, which, of course, are tied into the center sill structure in the desired manner. The lower surface of the car may be closed by bottom skin sheets 14 removably secured to the bottom cover plates of the bolsters and various cross members (not shown). The gap between the lower edge of the side sheets and the outer edge of the skin sheets may be closed by means of side extension members 16, which members may serve only as closure members or may be made sufficiently strong as to materially stiffen and form part of the side sill structure.

The side sill structure as shown in Figs. 1, 2 and 3 is formed by a main Z bar having its upper flange 18 positioned substantially horizontal and directed inwardly toward the center line of the car. The web 20 of the Z bar is disposed substantially vertically and connected to the bolster members by means of short angle 22 which angle, as shown in Fig. 2, extends a substantial distance on either side of the bolster. If desired, this angle may extend from end to end of the car but such use is not necessary. The lower flange 24 of the Z bar is directed outwardly and secured by any suitable means to a horizontal intermediate web 26 of a W shaped sill member. The vertically disposed intermediate web 28 of this W shaped sill member is secured directly to the outer ends of the bolster, while the upper and lower flanges 30 and 32 respectively are secured to the side posts and side sheathing and to the lower cover plates of the bolsters or other cross members. The side posts are also attached to the sill structure by means of an angular shaped plate 34 having one flange attached to the post and the other flange attached to the horizontal flange 18 of the Z bar member. It will be seen from the preceding that the side sill element is fabricated from a W plate, a Z bar and an angle and these members are so combined as to form in effect a cruciform sill with three arms of the cross provided with flanges 18, 30 and 32. The sill member may also be considered as made up of an E-beam to which an angle structure formed by flanges 26 and 30 has been attached in some manner.

In the form of sill shown in Figs. 4 and 5 the main sill element is formed by what may be termed an E-beam having vertically disposed web 40, inwardly directed lower flange 42, intermediate inwardly directed flange 44 and upper

inwardly directed flange 46. The lower and intermediate flanges, together with the lower portion of the web, provide means by which the sill element may be securely attached to the bolster and other cross members, while the upper flange provides a support for the floor and an attachment for the inner post brace 34. On the outer surface of web 40 a channel shaped member may be attached by means of vertically directed flange 48, thus placing the web 50 substantially horizontal and the other flange 52 in such a position as to be secured to the lower edge of the post and side sheet. If desired, instead of using a channel as just described a modified channel may be used having an additional flange 54 directed vertically and providing additional securing area of the modified channel member to the web of the E-beam, all as clearly shown in Figs. 6 and 7. In any event, whether the sill be formed of a true channel and E-beam as shown in Figs. 4 and 5, or a flanged channel and E-beam as shown in Figs. 6 and 7, a sill will be provided of flanged cruciform construction; that is, a cruciform sill with three of the arms formed with flanges 42, 46 and 52. These sill elements, like that described in connection with Figs. 1, 2 and 3, may also be considered as formed by an E-beam to which has been attached a flange 50 of an angle form member.

In the form shown by Figs. 8 and 9 the main side sill element is substantially the same as that just described in connection with Figs. 4 to 7 and accordingly the same reference numerals have been used. In this form, however, the outer face of the main sill web is provided with a flange 60 extending from the web substantially in alignment with the intermediate flange 44 and to this flange 60 is attached, by any suitable means, flange 62 of an angle member having its other flange 64 extending vertically for attachment to the side posts.

It will be seen that regardless of the component parts making up the sill elements, the final result has been a sill of cruciform section with three of the arms carrying flanges for attachment to the side posts and side sheet and floor and cross members. The sill may also be considered as formed of an E-beam to which has been attached the edge of one flange of an angle member, the other flange being used for attachment to the side posts. It will also be seen in all of the forms that the curved side sheet extension assists materially in strengthening the sill, and, as previously stated, this curved extension may be made of sufficient strength as to form a material part of the sill. In the form shown the vertical depth of the sill is slightly greater than the horizontal depth but any weakness in the horizontal direction is more than compensated for by the additional horizontally directed flanges, thus it will be seen that the sill will have substantially the same strength in a horizontal as in a vertical direction and will also have great strength in any direction between the true vertical and horizontal.

While the invention has been described more or less in detail, it will be obvious that various modifications and rearrangements of parts may be made without departing from the scope of the invention as defined by the appended claims.

What is claimed is:

1. A side sill for railway cars having side posts, bolsters and floor, said sill being of generally cruciform cross-section and formed of a W plate, to which is secured a Z member and an angle,

said W plate being secured to the posts and bolsters while said Z member supports the car floor and together with the angle provides additional attachment between the bolsters and W plate.

2. A side sill for railway cars having side posts, cross members and a floor, said sill being of generally cruciform cross-section and formed of an E beam, to the back of which is secured an angular member, the lower and intermediate flanges of said beam being directed toward and secured to said cross members and the upper flange being directed toward the longitudinal center of the car and secured to and supporting the floor, said angular member being secured to the side posts and forming with the back of said E beam an upwardly open substantially smooth pocket inclosing the lower ends of the posts.

3. A side sill for railway cars having side posts, bolsters and a floor, said sill being of generally cruciform cross-section and providing a web connecting vertically spaced upper, intermediate, and lower flanges directed toward the longitudinal center of the car from the inner side of the sill web, with the lower and intermediate flanges overlapping and secured to the bolsters and the upper flange supporting and secured to the car floor, said sill also providing an upwardly directed flange secured to the outer side of the sill web and spaced laterally outward therefrom and substantially normal to said first named flanges and secured to the side posts below the floor level and being of a width substantially equal to the distance between said intermediate and upper flanges.

4. A side sill for railway cars having side posts, bolsters and a floor, said sill being of generally cruciform cross-section and providing a web connecting vertically spaced upper, intermediate, and lower flanges directed toward the longitudinal center of the car from the inner side of the sill web, with the lower and intermediate flanges overlapping and secured to the bolsters and the upper flange supporting and secured to the car floor, said sill also providing an upwardly directed flange secured to the outer side of the sill web and spaced laterally outward from said first named flanges and secured to the side posts below the floor level and being of a width substantially equal to the distance between said intermediate and upper flanges, and a curved member directly connecting said upwardly directed flange and lower flange thereby stiffening the sill and forming therewith a substantially closed triangular shaped section.

5. A one piece side sill element for railway passenger cars, said sill comprising an E beam having a plain integral flange projecting laterally as the sole projection from the back of the beam web and located substantially in alignment with the intermediate flange of the beam, the lower flange of said beam being curved to conform to the under surface of the passenger car and said sill element being of substantially equal strength about its vertical and horizontal axes.

6. In a passenger car including a side wall, posts, a bolster, a floor, a side sill for said car including an upright E-beam, the flanges of which extend inwardly for supporting the floor and bolster, an outwardly extending flange projecting from the back of the E-beam web and terminating in an extremity for arrangement between and connection with said side wall and posts.

7. In a passenger car including side walls, posts, bolsters, and a floor, side sills for said car,

each of said sills including an upright E-beam, the flanges of said beam extending inwardly for supporting engagement with the floor and bolster, an outwardly extending flange projecting from the back of the E-beam web, said outwardly extending flange being bent upwardly to conform to the inner surface of said side wall, and the inner face of said bent flange portion forming a seat for engagement with the lower end portions of said posts.

8. A side sill for railway cars having posts, bolsters and a floor, said sill being generally cruciform in cross-section and having flanges projecting laterally from one side only of at least three of the arms of the cross, at least two of said flanges projecting in the same direction from adjacent the extremities of aligned arms of the cross and being connected to the floor and to said bolster, and the third flange projecting from adjacent the extremity of one of the other arms and at an obtuse angle thereto for connection to said posts.

9. A side sill for railway cars having posts and bolsters, said sill being generally cruciform in cross-section and formed of an E beam having the lower and intermediate flanges thereof adapted for connection to said bolsters, and an angular member secured to the back of the web of said E beam with one portion thereof arranged in the horizontal plane of the intermediate flange of said E beam and being substantially equal in length therewith and the other portion lapping and secured to the posts.

10. A side sill for railway cars having posts and bolsters, said sill being of generally flanged cruciform cross-section and formed of an E beam having a laterally projecting flange extending from the back of the web substantially in alignment with the intermediate flange of the web, the lower and intermediate flanges of said E beam lapping and being secured to said bolsters, and an angle member having one flange overlapping and secured to the laterally projecting flange and the other flange of said angle extending upwardly from the horizontal plane of said intermediate flange of the E beam and forming with the web thereof an upwardly directed channel for receiving said post extremities.

11. A side sill for railway cars having posts, bolsters and a floor, said sill being generally cruciform in cross-section and having flanges projecting laterally from one side only of three of the arms of the cross, at least two of said flanges projecting in the same general direction from adjacent the extremities of aligned arms of the cross for connection with said bolsters and floor, the third flange projecting from adjacent the extremity of one of the other arms and at an obtuse angle thereto for connection to said posts, said third flange forming with the adjacent arms an open trough like pocket of constantly varying width.

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