

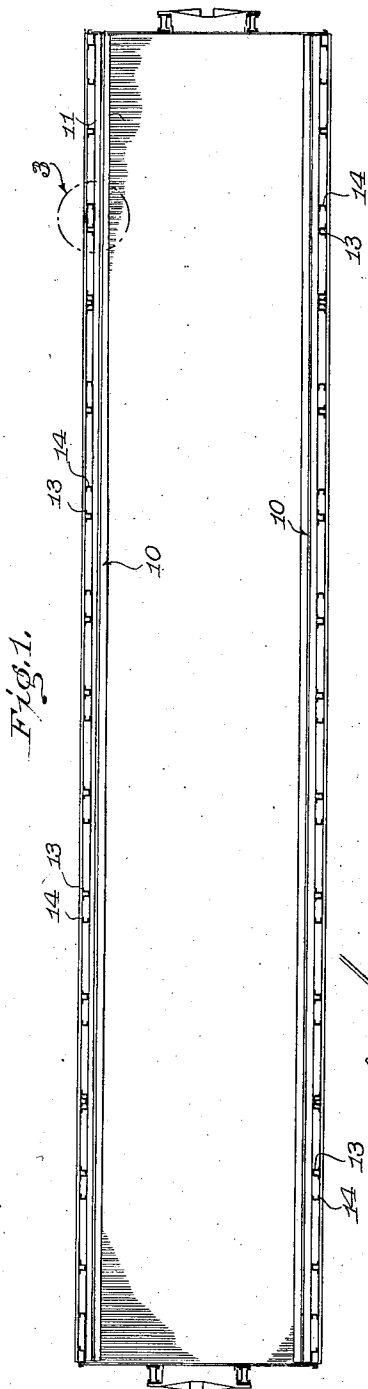
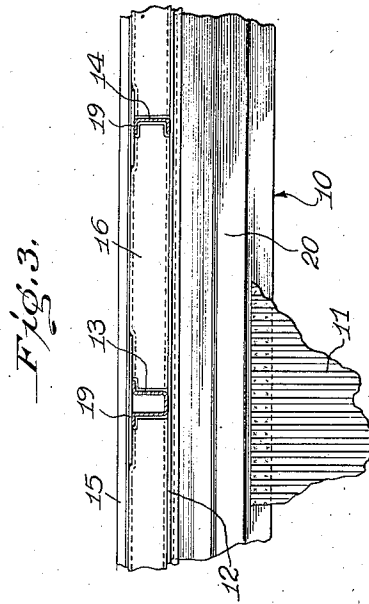
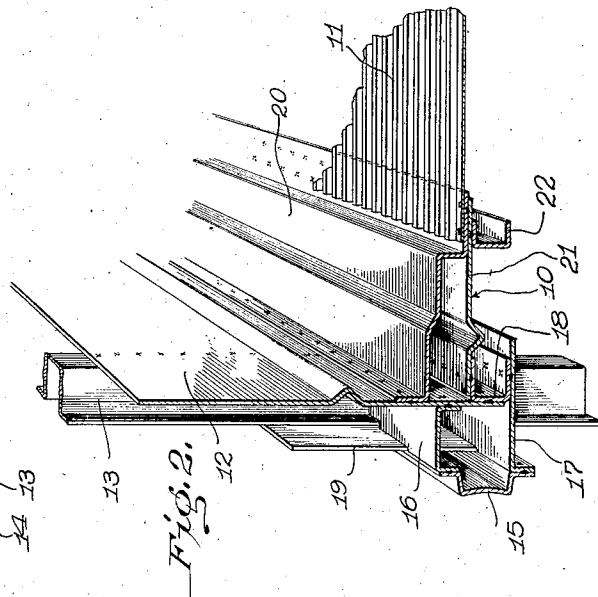
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SIDE SILL CONSTRUCTION FOR RAIL CAR BODIES

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SIDE SILL CONSTRUCTION FOR RAIL CAR BODIES

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7 Claims. (Cl. 105-418)

The invention relates to rail car structures and particularly to the side sills of such structures.

This application is a division of copending application Serial No. 296,026, entitled Rail car underframe, filed September 22, 1939.

It is an object of the invention to provide a side sill of great strength yet light weight, which can be readily fabricated out of light gauge sheet metal and the parts secured together by spot welding, and which, when assembled in the car structure, is located at the floor level and is designed to stiffen and strengthen the car body to take both vertical and lateral loads and to stiffen the underframe and assist it in taking longitudinal collision loads.

It is a further object of the invention to provide a side sill which can be readily subassembled with a side wall truss of the body to form the bottom chord thereof and which can be readily joined in final assembly to the underframe and flooring to function as a longitudinal strength member of the underframe.

To attain these objects the side sill of the invention is fabricated for the most part of through-running longitudinally formed strips of sheet metal secured together to a double box section construction stiffening the sill against vertical and transverse bending stresses. The through-running elements are arranged to form inner and outer elements of a box section chord interconnecting the bottoms of the posts of the side wall trusses and further to provide an inwardly extending box cross section disposed substantially in the plane of the flooring and having a final assembly joint for securement to the flooring, so that the sills on opposite sides of the body together with the flooring secured thereto form a strong shear panel resisting laterally directed shocks.

Other and further objects and advantages and the manner in which they are attained will become apparent from the following description when read in connection with the drawing forming a part hereof.

In the drawing:

Fig. 1 is a diagrammatic horizontal sectional view through a car body taken just above the flooring, showing a structure to which the side sill of the invention has been applied.

Fig. 2 is a fragmentary perspective view, the side sill being shown in section and in its relation to the side wall posts and flooring of the underframe.

Fig. 3 is a fragmentary sectional plan view similar to Fig. 1, but on an enlarged scale, the

view being taken in the area indicated by the circle 3 in Fig. 1.

The side sill structure according to the invention is shown in Fig. 1 extending from end to end of the body, one at each side, indicated generally by the reference character 10. In final assembly, these structures are strongly secured to the ends of the transverse members of the underframe, not shown, and to the flooring, preferably formed by the transversely corrugated metal sheeting 11. They are double box section structures which are preferably, for convenience of assembly, subassembled as parts of the adjacent side wall subassembly of the body. The side wall subassembly is a truss structure including longitudinal chords, vertical posts, and diagonals, and the side sill of this invention constitutes the lower chord of a side wall truss as well as a stiffening member of the underframe, by reason of its location substantially at the floor level.

Each of these side sill structures may comprise a vertically deep plate 12 extending the length of the car, and secured by welding to the inside wall of the vertical posts, as 13 and 14, and the diagonals (not shown) of the side frame truss, and an outside flanged channel 15 also running the full length of the body and secured to the outside walls of the posts and diagonals. These two through-running members are connected to form a box section between the posts by an upper channel 16 and a lower angular member 17 which extends inwardly beyond the posts and is secured to the bottom wall of a through-running longitudinal channel 18 which is welded to the plate 12. Gussets, as 19, may be interposed between the through-running channel 15 and the posts and the portions of the members 16 and 17 adjacent the posts and secured thereto to provide a strong joinder of these parts.

From the foregoing it will be seen that the members 12, 15, 16, 17 and 18 form one of the box sections of which the double box sectional side sill structure is composed. The other box section is a wide transversely extending box section, many times wider than deep, and includes an upper through-running generally Z-sectioned member 20 and a lower through-running longitudinally-ribbed member 21. The member 20 is secured through one of the arms of the Z to the plate 12, as by spot welding, and the other arm of the Z is extended horizontally and spot-welded throughout to the inner margin of the member 21. The outer margin of this member overlies the top wall of the channel 18 and is spot-welded thereto.

The overlapped inner margins of the members 20 and 21 are substantially in the plane of the top of the floor supporting stringers (not shown) and to this overlapped portion is further welded a longitudinally extending through-running channel-section stringer 22.

All of these parts can be readily assembled by spot-welding in the subassembly of the side wall truss and when the latter is brought into assembled relation with the underframe of the body, this double box section structure serves as an underframe side sill having high resistance to collision shocks transmitted to it either longitudinally or transversely.

In the final assembly the lower side walls of the angles 17 and channel 22 overlap the top of the floor beams (not shown) and are welded thereto and the vertical posts are also welded to the ends of said floor beams. Also in the final assembly, the side margins of the transversely corrugated floor sheeting 11 overlap and are spot welded to the overlapped inner margins of the respective side sill structures, it being understood that intermediate portions of the floor sheeting are further secured to the underframe as through longitudinal stringers (not shown).

From the foregoing description it will be seen that the strong columnar side sill structures 10 form a very important feature in light weight rail car construction, being designed, not only to resist deflection in carrying the vertical loads, but also to resist deflection transversely under laterally directed shocks, as well as acting as strong columnar structures resisting longitudinal collision shocks in the plane of the underframe. Combined with the corrugated floor sheeting extending between the side sill structures on the opposite sides of the car these side sill structures afford with the flooring a shear panel in the plane of the flooring strongly resistant against collision forces acting in said plane.

What is claimed is:

1. In a rail car, a side sill of substantially continuous double box cross-section from end to end and fabricated of a plurality of sheet metal strips, most of which extend the length of the car and at least one of which is common to both

box cross sections, one of said box-cross section portions of the sill extending inwardly of the side wall posts and forming the major portion of the transverse width of the sill.

2. A rail car side sill including a box section portion arranged inwardly of the side wall posts and many times wider than its height, said portion being fabricated of sheet metal strips extending the length of the car.

3. A rail car side sill including a vertical plate secured to the inside of the posts, said plate being a common element of two box sections, one outside and the other inside of said plate the inside box section being many times wider than its height.

4. A rail car side sill including a box section structure arranged inwardly of the side wall posts and of greater transverse width than height having a transversely extending flange at its inner edge and transversely corrugated floor plating secured to said flange.

5. A rail car side sill built up of light gauge sheet metal strips for the most part extending from end to end of the car, one of said strips being a vertically deep plate secured to the posts and other strips forming with said plate outer and inner box section reinforcing structures, extending the length of the car, the inner hollow section structure being many times wider than its height.

6. A rail car side sill comprising through-running inner and outer members adapted to be secured to the inner and outer faces of side wall posts, means connecting said inner and outer members between the posts, and further through-running members secured to each other and to said inner member to form therewith a box section structure extending the length of the car.

7. A rail car having side sills on the opposite sides thereof, each comprising transversely widened and vertically shallow box section structures having an inwardly extending flange projecting from the box section, and transversely corrugated floor sheeting overlapping the inwardly extending flanges of said sills and secured thereto.

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