

Aug. 15, 1961

S. F. UDSTAD

2,996,020

RAILWAY CAR

Filed Oct. 2, 1959

5 Sheets-Sheet 1

FIG. 1

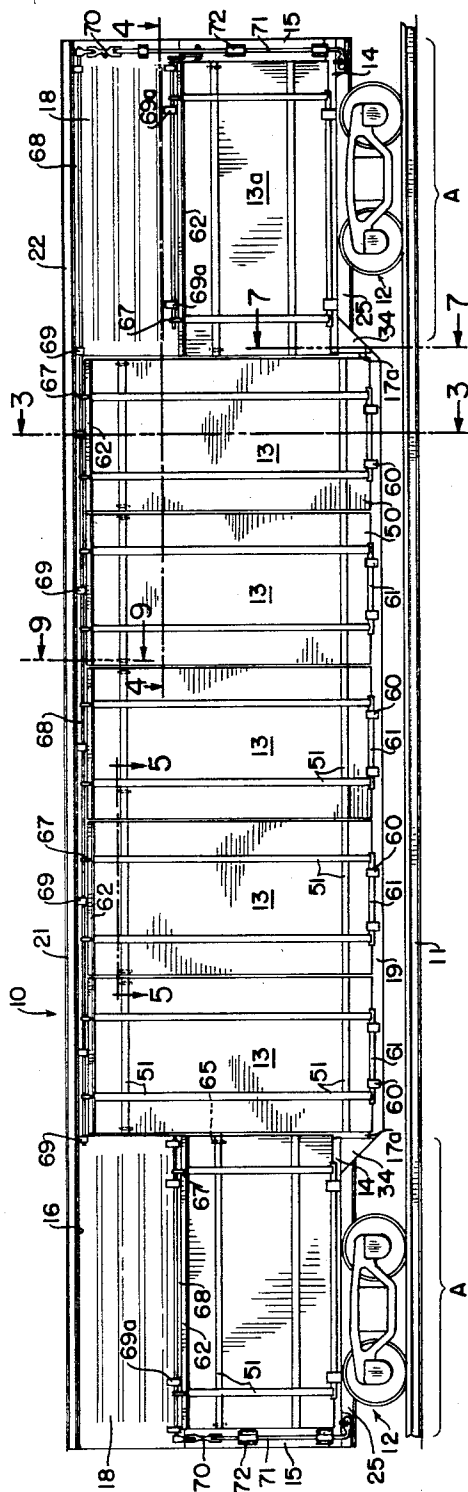
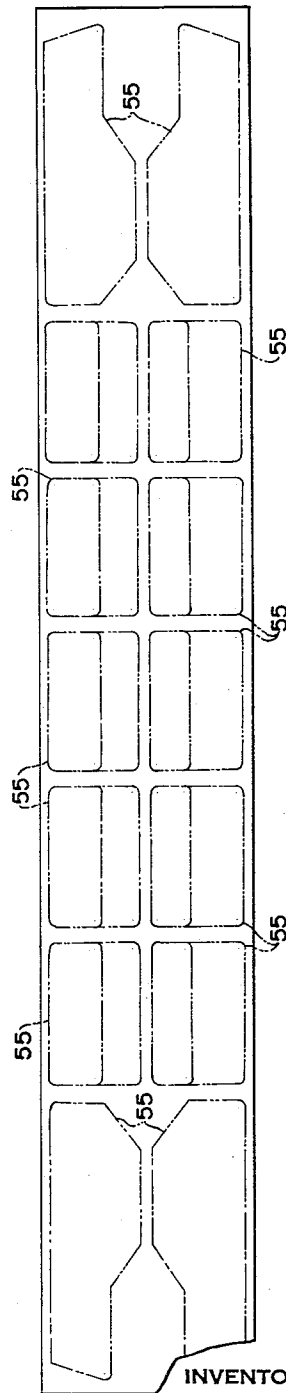


FIG. 2



INVENTOR
SIGVALD F. UDSTAD

BY
Robert A. Shields
ATTORNEY

Aug. 15, 1961

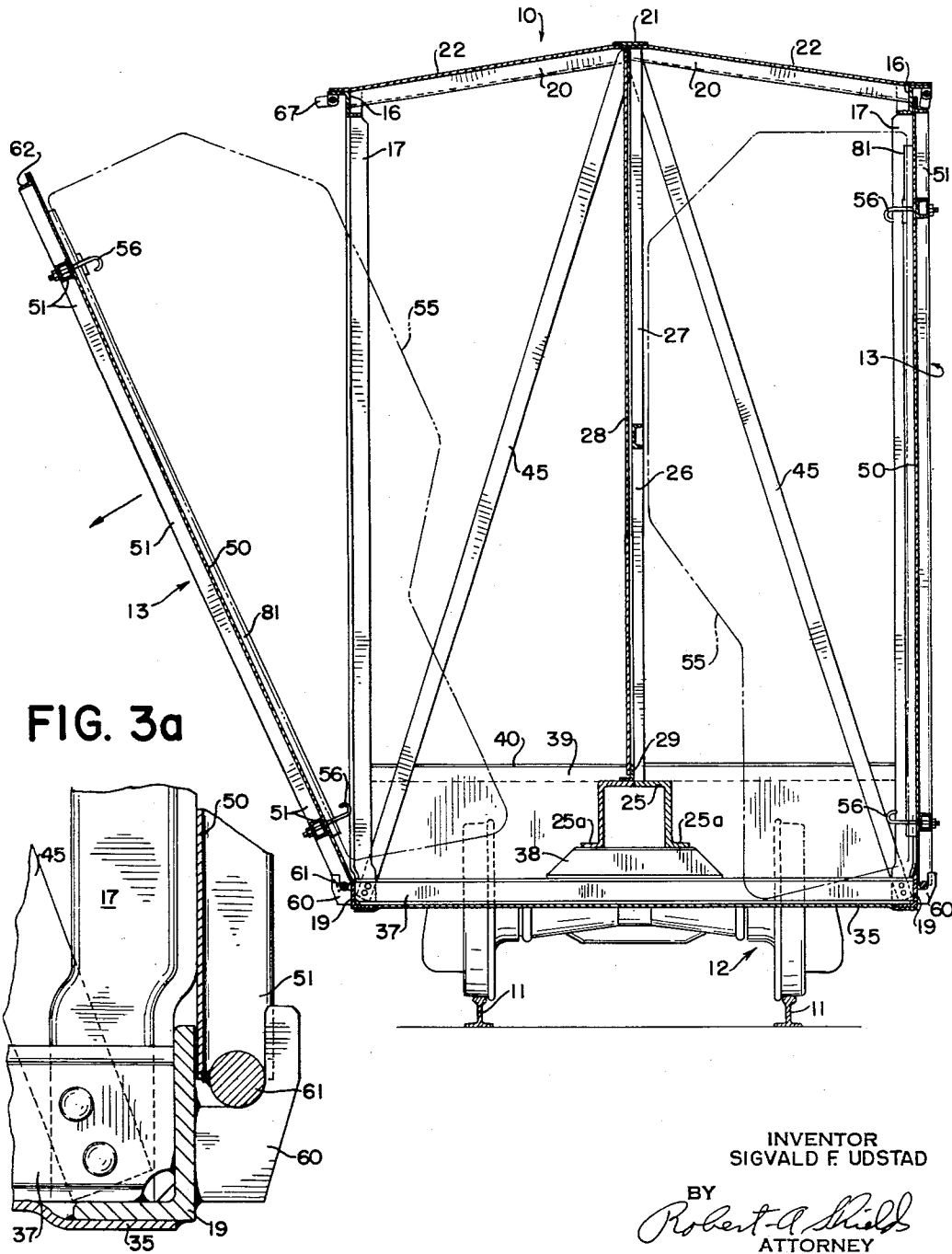
S. F. UDSTAD
RAILWAY CAR

2,996,020

Filed Oct. 2, 1959

5 Sheets-Sheet 2

FIG. 3



INVENTOR
SIGVALD F. UDSTAD

BY
Robert A. Shield
ATTORNEY

Aug. 15, 1961

S. F. UDSTAD
RAILWAY CAR

2,996,020

Filed Oct. 2, 1959

5 Sheets-Sheet 3

FIG. 4

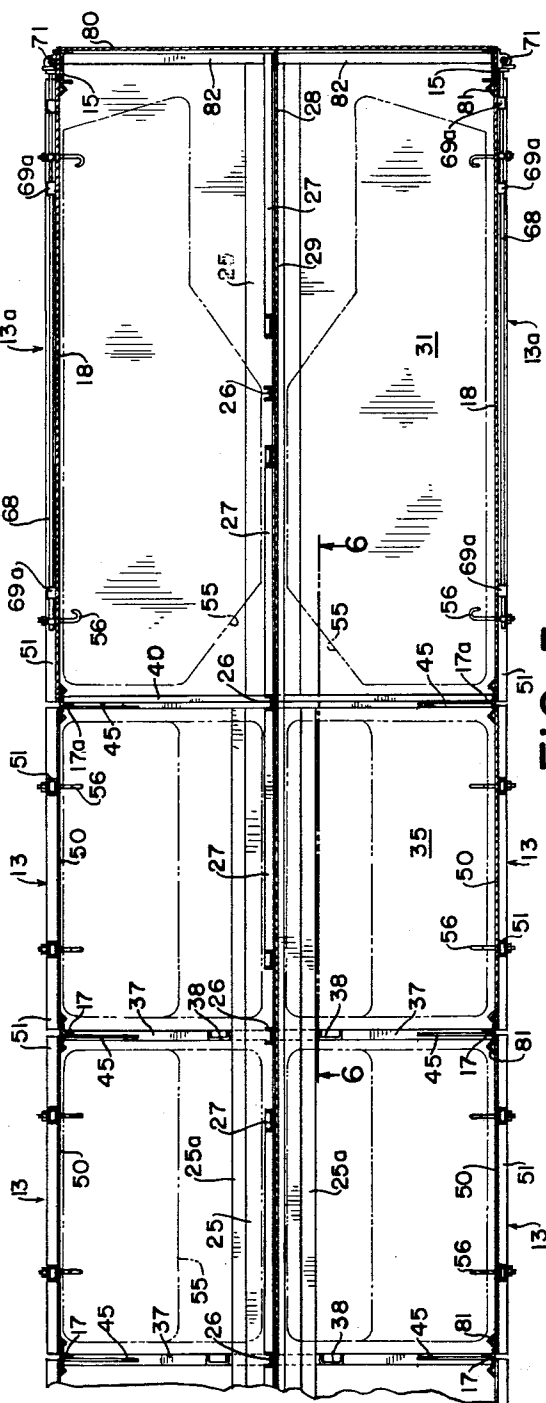
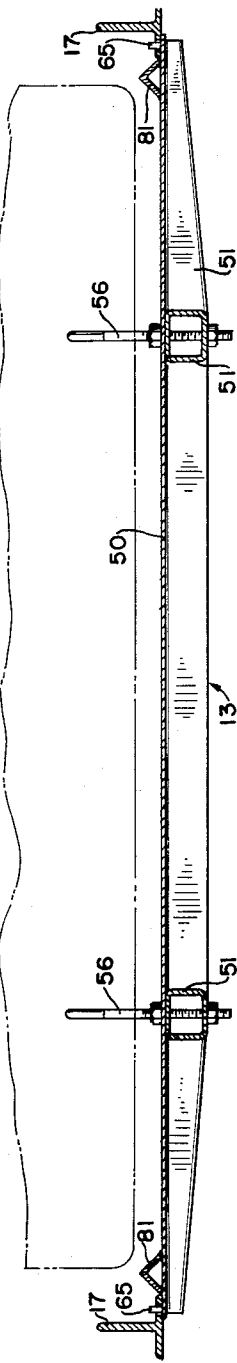


FIG. 5



INVENTOR
SIGVALD F UDSTAD

BY
Robert A. Shields
ATTORNEY

Aug. 15, 1961

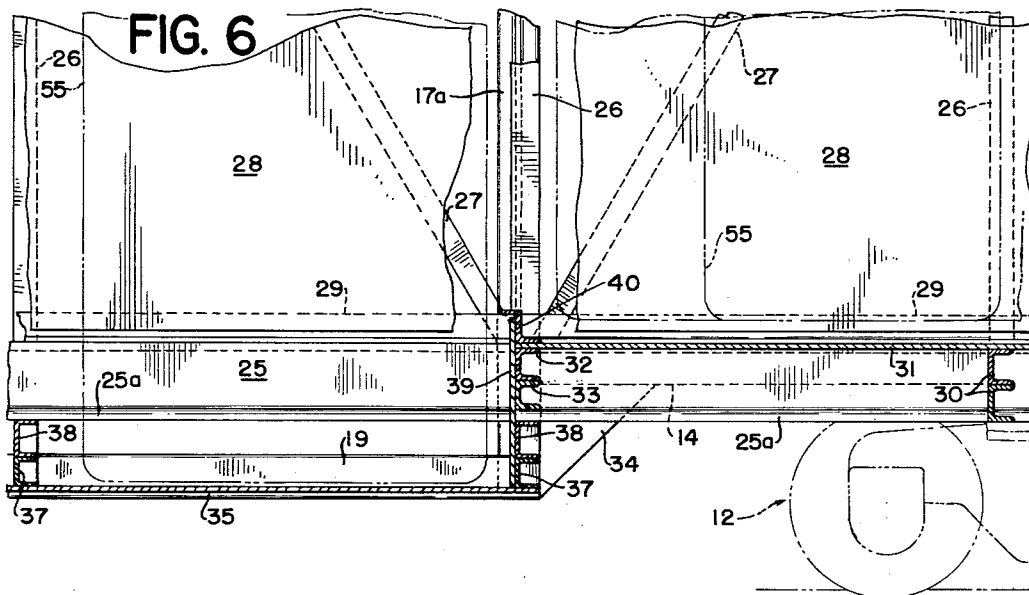
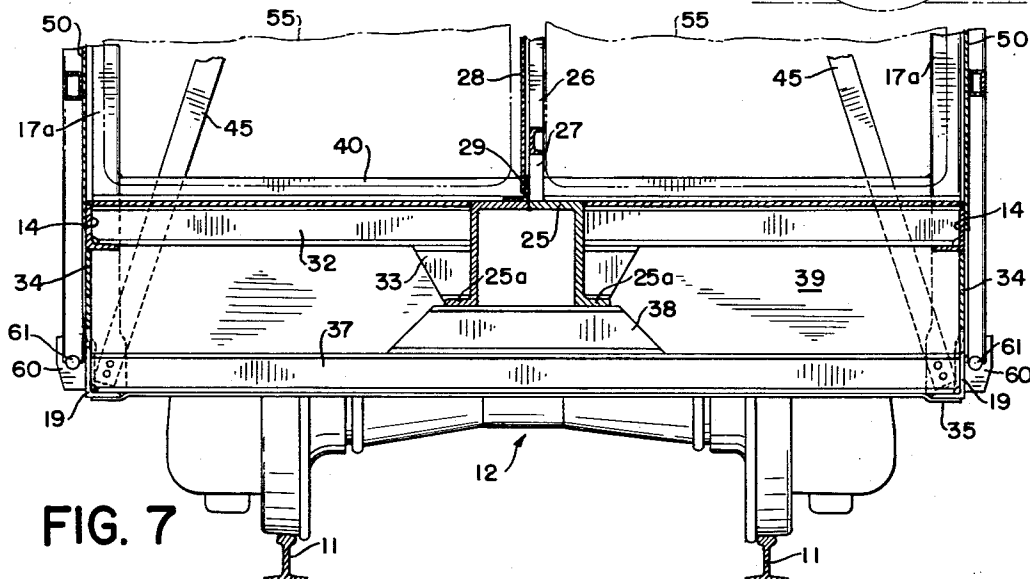
S. F. UDSTAD

2,996,020

RAILWAY CAR

Filed Oct. 2, 1959

5 Sheets-Sheet 4



INVENTOR
SIGVALD F. UDSTAD

BY *Robert A. Shield*
ATTORNEY

Aug. 15, 1961

S. F. UDSTAD
RAILWAY CAR

2,996,020

Filed Oct. 2, 1959

5 Sheets-Sheet 5

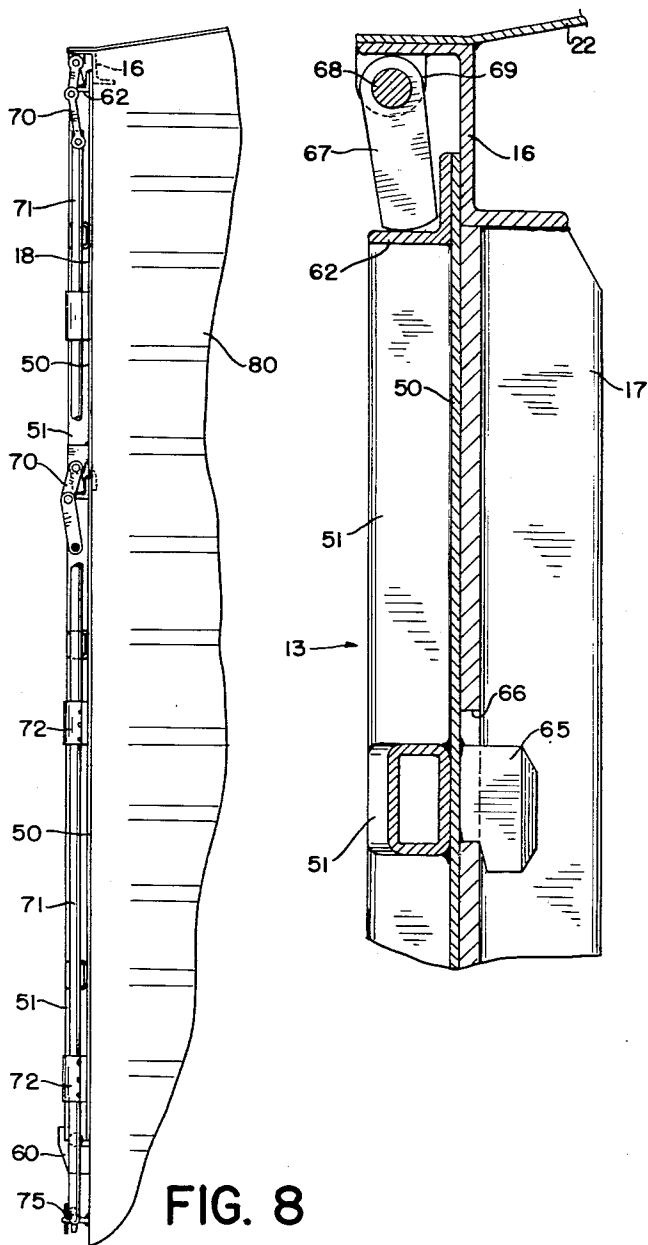


FIG. 9

INVENTOR
SIGVALD F. UDSTAD

BY
Robert J. Shields
ATTORNEY

1

2,996,020 RAILWAY CAR

Sigvald F. Udstad, Summit, N.J., assignor to ACF Industries, Incorporated, New York, N.Y., a corporation of New Jersey

Filed Oct. 2, 1959, Ser. No. 844,104
12 Claims. (Cl. 105—367)

This invention relates to railway cars for transporting automobile bodies or other large or heavy equipment and more particularly to such a car where lading bearing sides are removable and can be utilized as automobile body skids or lading pallets during loading and unloading operations. More specifically, the invention relates to a center sill carrying car wherein the roof is directly supported by the center sill, the extreme sides of the underframe carry the weight of the lading and wherein means are provided for transmitting the weight of the lading to the center sill to relieve the underframe sides and for dissipating the torsion loads in the car frame through the center sill without overstraining the car underframe.

The objects of the invention include the provision of a railway car capable of transporting automobile bodies and the like with their longitudinal axes vertically oriented to utilize as much space in the car as possible. Notwithstanding this vertical posture of the lading it is an object of the invention to provide such a car with body measurements well within the approved limit clearances of the Association of American Railroads for interchange service. Other advantages of the car of the invention include roof and side wall protection against weather damage to lading yet quick and easy access to the lading on either side of the car throughout its length.

Further advantages of the invention will be seen when viewed in the light of the following specification and accompanying drawings.

In carrying out the objects of the invention, there is provided a car having a longitudinally disposed centrally positioned center sill girder structure. The cross-ties, connected at their ends by the side sills, are supported by and depend from the undersurface of the center sill between the trucks in the central zone of the car to provide extra vertical lading space. The center sill girder structure extends upwardly to support the car roof and removable lading bearing side wall sections are provided. In a preferred embodiment, diagonal truss members connecting the center sill girder and the low lying side sills transmit the lading load from the sides of the car to the center sill structure and also alleviate longitudinal torsion loads in the underframe by directing them to the center sill structure.

In the accompanying drawings:

FIGURE 1 is a side elevation of the center sill carrying railway car of the invention;

FIGURE 2 is a diagrammatic plan view sketch of the car of FIGURE 1 showing the relative positions of a plurality of automobile bodies being transported therein;

FIGURE 3 is a section taken along the line 3—3 of FIGURE 1;

FIGURE 3a is a blown up view of the lower right hand corner of FIGURE 3 showing the support connection of the removable side wall section and the side sill of the car;

FIGURE 4 is a section taken along the line 4—4 of FIGURE 1;

FIGURE 5 is a section taken along the line 5—5 of FIGURE 1;

FIGURE 6 is a section taken along the line 6—6 of FIGURE 4;

FIGURE 7 is a section taken along the line 7—7 of FIGURE 1;

2

FIGURE 8 is an end view partly broken away of the car of FIGURE 1; and

FIGURE 9 is a section taken along the line 9—9 of FIGURE 1.

FIGURE 1 shows a railway car 10 supported on rails 11 by trucks 12. In the end zones of the car, indicated by bracket A, removable lading supporting side wall sections 13a are supported on side sills 14 which are normally disposed above the uppermost plane of the truck wheels. These end zone side wall sections are disposed with their longitudinal axes lying in a horizontal plane. The end posts 15 at each end of the car connect the sides of the end walls 80 and, together with the roof side plate Z-member 16 and the first side post 17a in from the end, form the upper and side framing members of stationary portions 18 of the car sides. The lower edge of each of these portions defines the top margin of the removable side wall openings at the ends of the car on either side thereof.

In the central zone of the car between the trucks, removable lading supporting side wall sections 13 are supported on lowered side sills 19 and have their longitudinal axes extending vertically. The removable side wall openings extend between the side posts 17 of the car and from the lowered side sill 19 to the roof side plate Z-member 16.

As best seen in FIGURE 3, the side post T-members 17 connect at their upper end to the undersurface of the Z-shaped side plate 16 and are bent inwardly at their lower ends for connection within the angle of the lowered side sill 19 on either side of the car and are utilized more as wall section separator frames and safety connections for the wall sections rather than as structural support members.

The side plates 16 of the roof extend longitudinally of the car between their end connections to the end posts 15 on either side for the length of the car and connect the outer ends of longitudinally spaced transverse roof carlins 20. The inner ends of the carlins are secured to a longitudinally disposed T-member 21 which runs the entire length of the car between its end connections to the end walls. Suitable roof paneling 22 is secured by the side plates, carlins and longitudinally disposed T-member on either side of the car.

The longitudinally disposed T-member forms a top chord integral with the center sill structure which comprises a longitudinally disposed bottom chord 25 running end to end of the car and which takes the place of the normally disposed center sill. It is connected to the top chord T-member by a series of longitudinally spaced uprights 26 which are channel-shaped in cross section, as best seen in FIGURES 3, 4, 6 and 7. The center sill structure or girder is reinforced by similarly channel-shaped diagonals 27 extending between and connecting the top chord and bottom chord at the connecting points of the uprights and the chords. A central wall section 28 may be secured to the webs of the channel-shaped uprights and diagonals and in the car shown is a metal structural member connected along its top edge to the longitudinally disposed T-member and along its bottom edge to a longitudinally disposed angle member 29 which is in turn secured by its horizontal leg to the top surface of the bottom chord.

The bottom chord, as in a usual center sill construction, is made up of two opposing Z-members connected along their top horizontal leg edges and forming outwardly extending flanges 25a with their bottom horizontal legs. In the right hand lower corner of FIGURE 6 it is seen that in the end zones of the car pairs of stacked endwardly facing channel members 30 form a portion of the body bolster and connect the sides and bottom flanges of the bottom chord to the normally disposed side sills

3

on either side of the car. The upper surface of the bolster, together with the normally disposed side sills and end sill beams 82 (FIGURE 4), support floor plates 31 on either side of the center sill. These plates have their top surfaces lying in a plane common with the top surface of the bottom chord of the center sill structure. The inner ends of the end zone floor plates are supported on the upper horizontal legs of endwardly facing channel-shaped cross-tie members 32 extending transversely between and connecting the inner ends of the normally disposed side sills and the upper sides of the bottom chord on either side of the car.

Short channel-shaped pieces 33 add support to the transverse cross-tie members 32 at their bottom chord connections and connect the inboard ends of the transverse cross-tie members and the bottom flange of the bottom chord, as best seen in FIGURE 6. Gussets 34 reinforce the corner connection of the inner ends of the normally disposed side sills and the side posts 17a which extend downwardly to their connection with the lowered side sills 19. Throughout the central zone of the car a dropped false floor is provided and comprises floor paneling 35 secured at its sides to lowered side sills 19. These side sills connect the longitudinally spaced transverse cross-ties 37 at their ends and the bottom surfaces of these cross-ties provide further connection for the floor paneling. As best shown in FIGURES 3, 4, 6 and 7, the cross-ties 37 depend from and are connected to the bottom chord at their center portions by short channel-shaped endwardly facing spacers 38 in order to provide more depth in the central zone lading space. Enclosure or partition plates 39 extend between the lowered side sills and normally disposed side sills at the ends of the central zone of the car. They extend inwardly from their connections to the side sills on either side of the car to the bottom chord and have their endwardly facing surfaces flush with the webs of the transverse cross-ties 37, the spacers 38, the channel pieces 33 and the cross-tie members 32. The plates extend upwardly and are secured to transversely disposed Z-members 40, laterally spaced on either side of the center sill. These Z-members have their lower horizontal legs extending endwardly of the car over the top edge of the partition plate. Their ends connect side posts 17a and the top surface of the bottom chord on either side of the car.

The longitudinal spacing of the cross-tie members 37 in the central zone of the car coincide with the spacing of the side posts 17 in order to provide as much uninterrupted depth space as possible for the lading supported on the removable side wall sections which will be framed fore and aft by the side posts.

Laterally extending diagonals 45 longitudinally spaced in the central zone at the same intervals as the side posts and cross-ties 37 connect the top chord of the center girder and lower sides of the car. FIGURE 3a shows the side connection of one of the diagonals where rivets interconnect the outer end of the cross-tie 37, the lower end of the side post 17 and the outer end of the diagonal.

The removable lading bearing side wall sections 13, 13a comprise a wall panel 50, constructed, in this instance, of a solid light gauge steel sheet, reinforced by box girders 51 adjacent the panel ends and sides. FIGURE 5 shows inwardly extending lading anchorage hooks 46 piercing the panel and the box girders at their points of intersection and held in place by nuts, one tightened by threaded engagement with the hook body against the lading bearing surface on the inside of the panel and one similarly tightened against the box girder structure on the outside surface thereof. Four hooks are provided for each section, as indicated in FIGURES 3 and 5, for anchoring an automobile body. Guide strips 81 are provided along the inner surface sides to assist in positioning the sections when loading the car. The automobile bodies 55, illustrated throughout the drawings in dotted

4

lines, comprise the body structure extending from the rear of the automobile to its fire wall.

Longitudinally spaced pairs of vertically slotted brackets 60 secured to the normal and lowered side sills provide support for longitudinally extending trunnion bars 61 secured adjacent the bottom edge of each wall section. An angle piece 62 extends along and is secured by its vertical leg to the outer surface of the top edge of each panel with its horizontal leg abutting the top ends of the vertically disposed box girders. The edge of the vertical leg of the angle piece is made to lie in a plane common with the top edge of the panel. When a wall section is in place with the lower edge trunnion lowered into the bracket slots, the side portions of the panel inner surface lie flush against the longitudinally extending flanges or T-heads of the side framing door posts while the bottom portion lies against its supporting side sill. In the end zones, the end portion of the inner surface of the panel lies flush against the web of the inwardly facing channel-shaped end post. The top portions of the wall sections in the central zone of the car lie against the side plates on either side of the car and in the end zones, lie against the turned in lower margin of the stationary portions 18 of the car sides as indicated in FIGURE 8. The body of the stationary portions above the margin lie in the same plane as the panels of the removable end zone wall sections 13a.

In FIGURES 8 and 9 is seen the wall section latching features provided in the car shown. A latch projection 65 having a head with an outwardly facing bearing surface extending downwardly is secured adjacent the upper portion of the inner surface of the panel on either side thereof. The side and end posts provide openings 66 for the latch projections and when a wall section trunnion is lowered into the bracket slots the downwardly extending bearing surface of each latch head engages the inner surface of the horizontally extending flange of the framing posts. These latch extensions provide restraint against lateral movement of the wall sections.

Vertical movement of the sections is restrained by finger latches 67 longitudinally spaced along and bearingly secured to longitudinally extending lock bars 68 positioned above the wall sections so that the finger projections assume a vertical position directly overlying the horizontal legs of the top edge angle pieces 62 of the wall sections and barely in contact therewith. A lock bar is journaled for rotary movement in lugs 69 attached to the side plates on either side of the car in the central zone and, in each end zone, lugs 69a secured to the stationary wall portions on either side of the car similarly support a lock bar positioned above the end zone removable wall section. Each lock bar at one end connects links 70 operatively connecting vertical slide bars 71 journaled in brackets 72 vertically spaced along the ends of the side of the car and secured by the webs of the end posts. In FIGURE 1, it is seen that the car shown provides link connection to a single vertical slide bar for an end zone lock bar and the central zone lock bar while link connection to a second slide bar positioned at the other end of the car is provided for the other end zone lock bar. The arrangement of the bars is the same on the other side of the car.

As seen in FIGURE 8, the lower link of each double link connection in each instance is pivotally attached to the slide bar while the upper link is fastened to the lock bar. The connection between the joining ends of the upper and lower links is pivotal. As the pivotal connection is outwardly offset from the longitudinal axis of the slide bars, the lifting of the slide bars effects a rotation of the lock bar and resultingly of the finger latches in a clockwise direction causing the finger to assume a substantially horizontal position as seen in FIGURE 3. This permits an operator to lift the wall section so that the latch head extension is moved up and out of the

5

post slots 66 permitting a rotation of the wall section trunnions in their bracket supports to pivot the section in the direction indicated by the arrow in FIGURE 3. The section may then be removed with its lading secured to it and used as an automobile skid or a lading pallet where other lading is being unloaded. The reversed procedure brings the wall section into place for locking by permitting the slide bars to drop to rotate the finger latches back to their vertical position over the angle piece at the top of the wall sections. The lower end of each slide bar is provided with a turned portion which lies longitudinally of the car, is slotted to receive a bracket 75 having an aperture for a pin lock as best seen in FIGURES 1 and 8.

It is now clear that the railway car of the invention provides removable lading bearing side wall sections which are in turn capable of performing the function of lading pallets and in the railway car shown of automobile body skids. Because of this feature, the car has the advantage of the easy and quick loading and unloading operation of a flat car and yet provides roofing and side wall protection against weather and vandalism.

In the specific embodiment described and as seen in FIGURE 2, ten automobile bodies having their longitudinal axes vertically oriented may be carried in the central zone of the car which provides lading space well beneath the normal height of a floor supporting center sill. Four additional automobile bodies are carried over the trucks with their longitudinal axes horizontally oriented but still utilizing the removable skid or wall sections having their longitudinal axes similarly horizontally disposed.

As the weight of the lading is carried by the sides of the car, there is provided a center sill carrying structure which enables the transmission of the lading weight from the sides as well as the provision of a roof. This weight transmitting feature is accomplished by the laterally extending diagonals connecting the sides of the car to the center girder structure. In the car described the center girder is shown with a center wall section 28 as an integral wall structure but obviously any suitable open-work girder or truss structure may be employed. The positioning of these diagonals has a further advantage in that the longitudinal torsion loads created in the car in transit are directed from the underframe to the center girder.

Those skilled in the art will be able to utilize the present invention in various ways and it is not meant to limit the scope and spirit of the invention to the specific embodiment described and shown. The spirit and scope of the invention is limited only by the following claims.

What is claimed is:

1. A railway car comprising, an underframe, a skeleton superstructure carried by the underframe, a plurality of bodily removable side wall section carried by the skeleton superstructure, said sections forming lading pallets and having means for supporting and carrying lading secured thereto, and means for detachably supporting said side wall sections on said sides.

2. In a railway car the combination of a truck mounted body comprising skeleton sides, longitudinally spaced transverse members connecting the sides, a longitudinally and centrally disposed upwardly extending center girder, said transverse members being positioned below and depending from said girder, a roof supported by said center girder in upwardly spaced relation to said members, and a plurality of removable side wall sections supported by said skeleton sides and forming lading pallets having means for supporting and carrying lading secured thereto.

3. The railway car of claim 2 wherein means are provided connecting said skeleton sides and said center girder for transmitting lading weight from said side wall sections to said girder.

4. The railway car of claim 3 wherein said means includes diagonals connecting said skeleton sides to said center girder adjacent said roof.

6

5. In a railway car body, the combination of, a deep central girder structure having an undersurface and supported at its ends by trucks, longitudinally disposed side sills extending in vertical planes transversely spaced on either side of said central girder structure, longitudinally spaced transverse members connecting said side sills and central girder, said transverse members being connected at their center portions to the undersurface of said deep central girder structure, said deep central girder structure extending upwardly above said sills and transverse members, a roof connected to and supported by said central girder, longitudinally disposed side plates formed as part of the roof and extending substantially in the same vertical planes as said side sills, a plurality of removable side wall sections supported by the body, said sections forming lading pallets having means for supporting and carrying lading secured thereto, and means detachably securing said sections to said side plates and side sills.

6. The railway car body of claim 5 wherein means connect the outer ends of said transverse members and the upper portion of said deep central girder structure for transmitting lading weight to said deep central girder structure.

7. A railway car comprising an underframe having longitudinally spaced transverse members connected at their ends by longitudinally disposed sides extending in vertical planes transversely spaced on either side of said car, a longitudinally extending girder centrally disposed and supported at its ends by trucks, said transverse members depending from said center girder by means of spacer elements for deepening the lading space above said members, said girder extending vertically upward, a roof supported by said center girder and including longitudinally disposed side plates extending in vertical planes common with said sides, vertical side post frame elements spaced longitudinally at the same intervals as said longitudinally spaced transverse members and connecting said sides and side plates, removable side wall sections forming lading pallets each having an inner surface and means for carrying lading secured thereto, said wall sections having upper, lower and side margins, said inner surface at said margins being in flush contact with said side plates, said sides and said post framing elements when said wall sections are supported by said sides, means on said sides complementary to means on said lower margin of said wall sections for removably supporting said sections, means on said car complementary to means on said wall sections for restraining vertical and lateral movement thereof and means connecting said sides and said girder for transmitting lading weight to said girder, said last mentioned means transmitting longitudinal torsion loads to said girder when said car is in transit.

8. A lading pallet for attaching to a side of an open skeleton railway car and forming a removable side wall section covering and closing an opening therein, said pallet comprising a solid panel having means for carrying lading secured thereto, said solid panel having margins defining an area complementary to the opening in the skeleton side of the railway car, and means on said panel for removably connecting said panel to the skeleton side of the railway car to close the opening.

9. The lading pallet of claim 8 wherein said last mentioned means include first means secured to one of said margins for detachable connection to complementary means on the railway car for vertical load support of said pallet thereon, and second means secured to said pallet for detachable connection to complementary means on the railway car for retaining said pallet against the skeleton side of said car to close the same during transit.

10. A truck mounted railway car having an underframe, skeleton sides, a roof supported by said underframe, said roof and underframe defining vertically spaced upper and lower margins of car side openings, a plurality of removable side wall sections adapted to

close said openings, said sections forming lading pallets, means on said pallets for carrying and supporting lading secured thereto and having vertically spaced upper and lower margins complementary to said upper and lower margins of said car side openings to close the same, and means at the lower margins of said sections and engaging complementary means carried by said underframe for removably supporting said pallet sections on the car.

11. The method of loading a railway car comprising, fixing the lading to a surface of a solid lading pallet, removably securing said pallet to a side of the car with said surface and lading facing inwardly, fastening said pallet to the car with the other surface of the pallet facing outwardly of the car to form a weather proof lading carrying side wall for the car.

12. A railway car body having an underframe, side sections vertically oriented and removably attached to the underframe, said side sections forming lading pallets, means attached to said pallets for carrying lading thereon, said side sections having lower margins, trunnions attached thereto, bracket means attached to said under-

frame and having open topped vertical slots receiving said trunnions and supporting the same therein, and stop means provided on said car body limiting vertical and lateral movement of said sections when said trunnions are supported in said slots.

References Cited in the file of this patent

UNITED STATES PATENTS

626,535	Gradlmler	June 6, 1899
1,418,634	Fife	June 6, 1922
1,519,319	Manning	Dec. 16, 1924
1,788,667	Friedlaender	Jan. 13, 1931
2,083,553	Blomberg	June 15, 1937
2,320,216	Brister	May 25, 1943
2,333,441	Rearwin et al.	Nov. 2, 1943
2,756,694	Wardein	July 31, 1956
2,783,718	Cheshire	Mar. 5, 1957

FOREIGN PATENTS

346,951	Germany	July 28, 1922
---------	---------	---------------