United States Patent [19]

Pringle

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[54] **RAILWAY CAR**

[75] Inventor: **William L. Pringle**, Grosse Pointe Shores, Mich.

[73] Assignee: **Pullman Incorporated**, Chicago, Ill.

[22] Filed: **Aug. 21, 1970**

[21] Appl. No.: **65,872**

[52] **U.S. Cl.**.....**105/368 R**, 105/367, 105/377, 105/378, 105/414

[51] **Int. Cl.**.....**B60p 3/06**, B61d 45/00

[58] **Field of Search**..105/368 R, 367, 377, 378, 414, 105/416; 296/1 A

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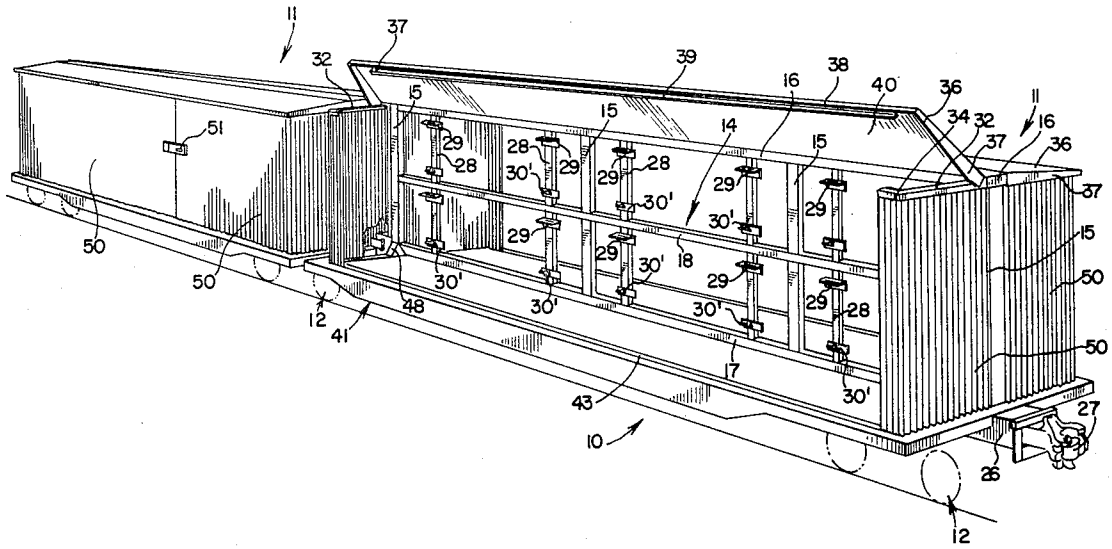
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Primary Examiner—Drayton E. Hoffman
Attorney—Hilmond O. Vogel

[57] **ABSTRACT**

A railway car consists of articulated sections each including a substantially identical upright longitudinally extending truss structure on which vehicles or other cargo is suspended. The truss structure is the primary structural member extending between the car trucks and also serves as the cargo retaining member during transport operation. The truss structure is provided with suitable beams containing brackets to which the cargo is connected and suspended therefrom. The cargo may be in the form of vehicles which are initially connected to pallets or fixtures secured to the underframe members of the vehicle. The fixture is provided with brackets which interengage the brackets on the truss structure to suspend the vehicles directly thereon. The fixture is constructed so that a crane or other material handling device, by engaging and lifting the fixture simultaneously, rotates the fixture and the vehicle into the desired position relative to the truss, the loading operation consisting merely of hanging the fixture and vehicles on the truss so that both are removably retained thereon in suspended relation.

6 Claims, 11 Drawing Figures



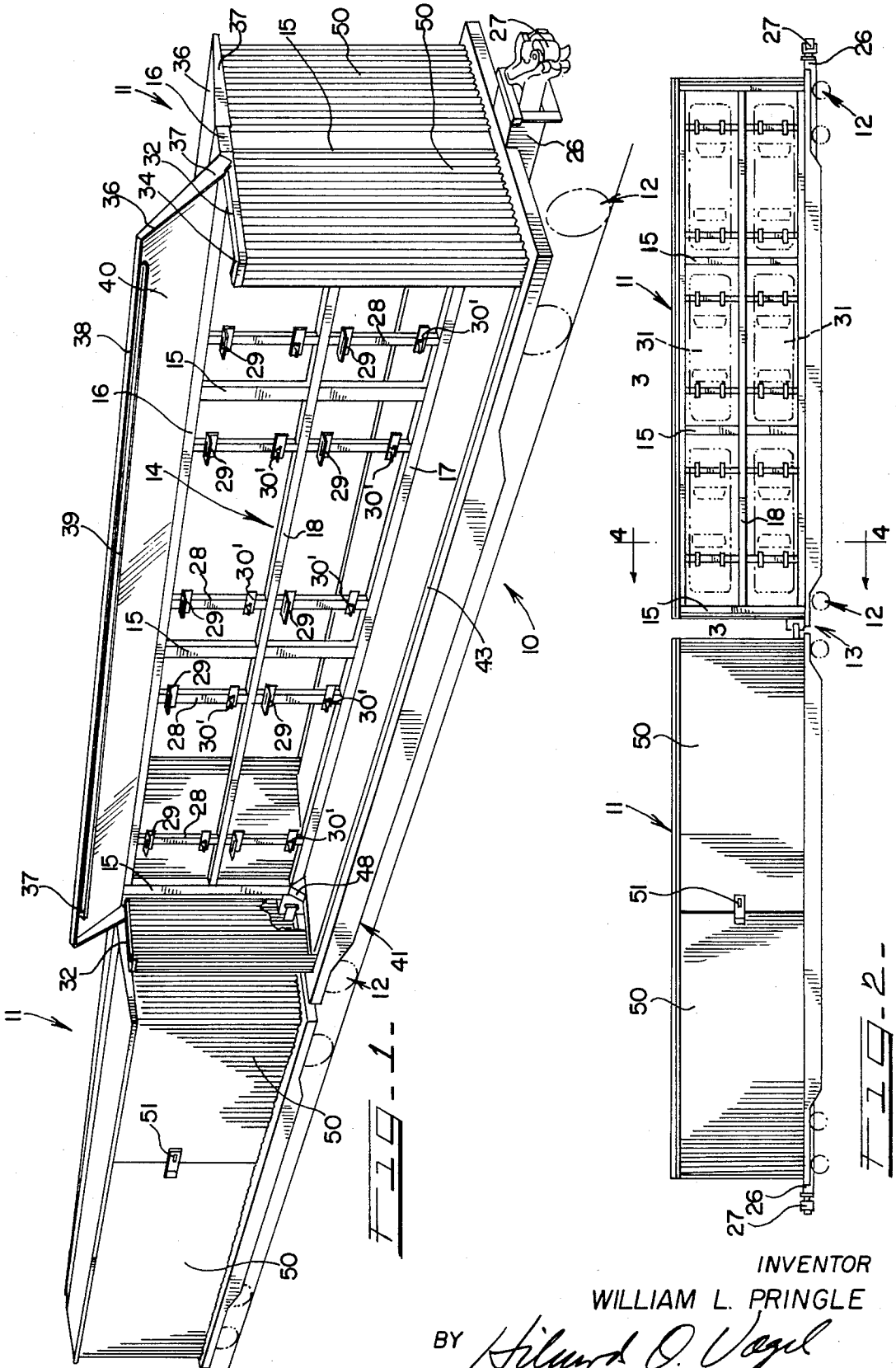


FIG - 1 -

FIG - 2 -

INVENTOR
WILLIAM L. PRINGLE
BY Edward O. Vogel
ATT'Y.

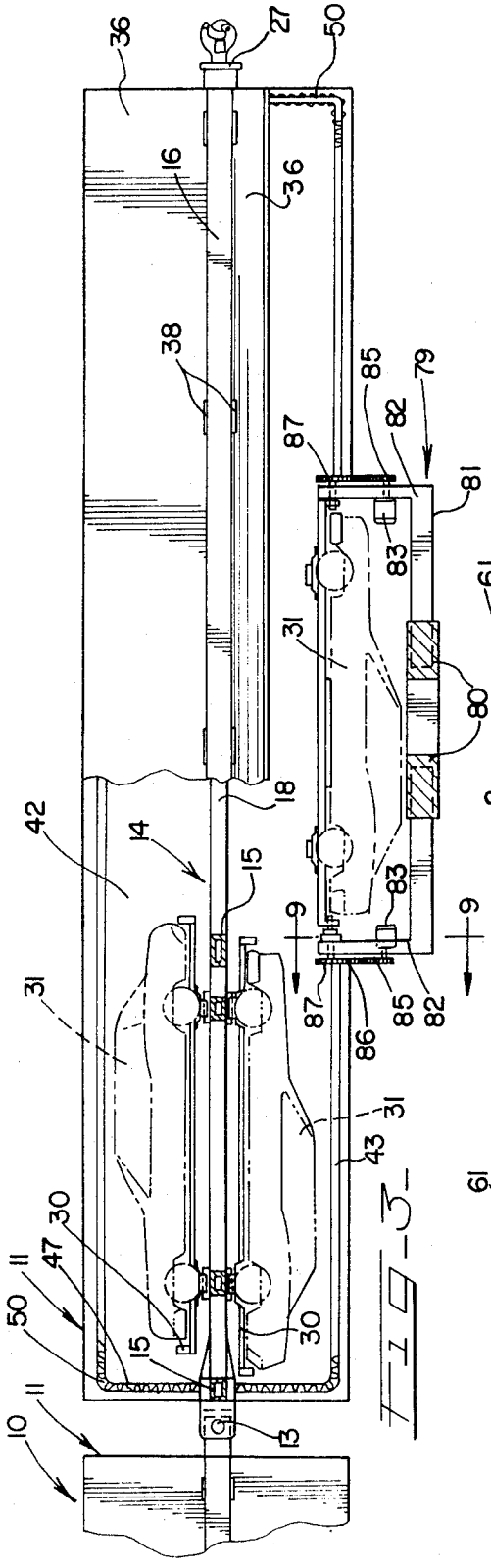


FIG-3-

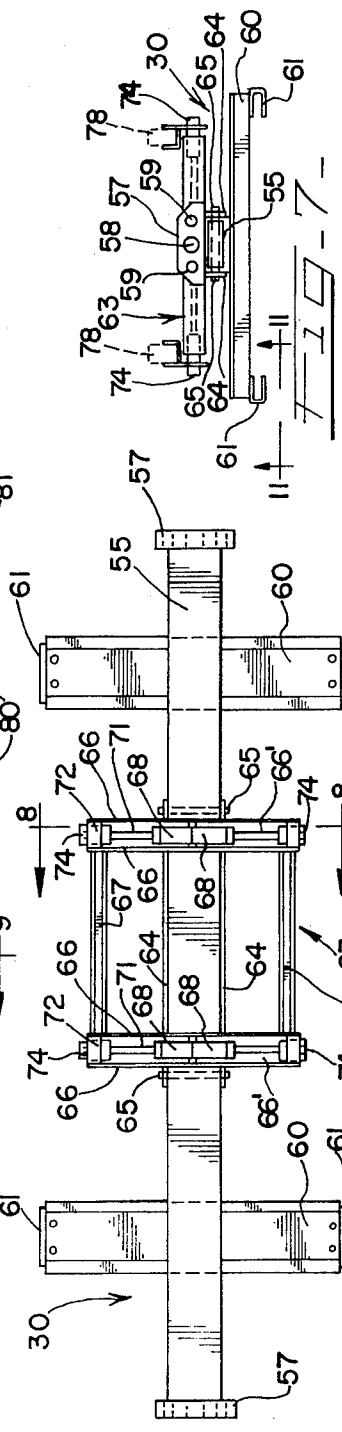


FIG-5-

FIG-7-

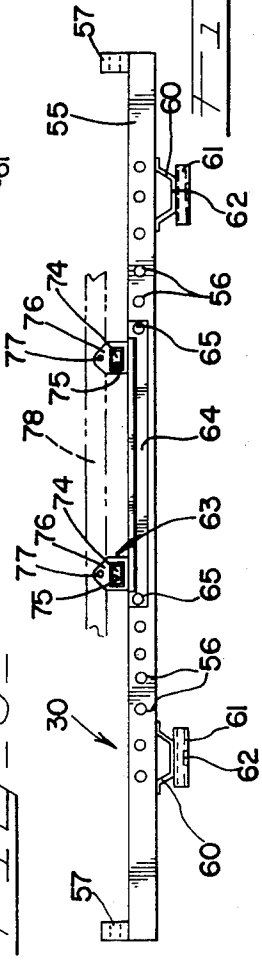


FIG-6-

INVENTOR
WILLIAM L. PRINGLE
BY Edward O. Vogel
ATT'Y.

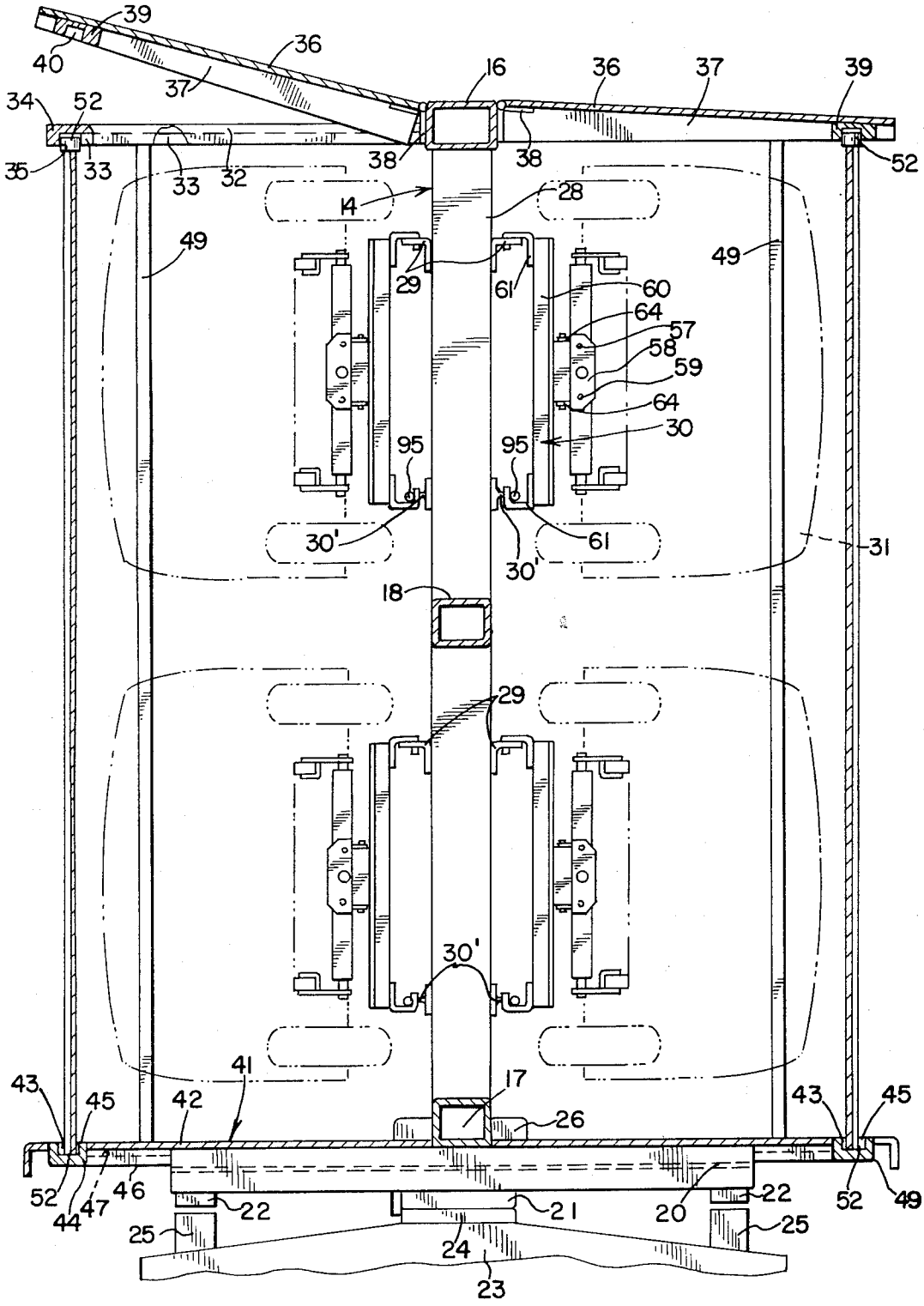
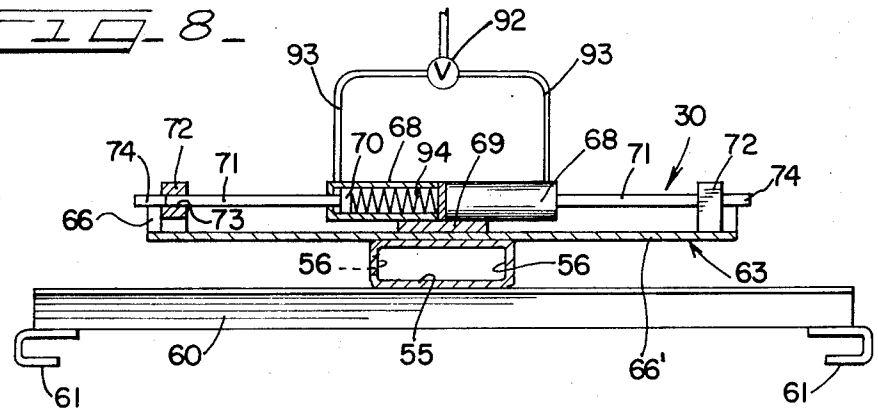


FIG-4-

INVENTOR
WILLIAM L. PRINGLE
BY Howard O. Vogel
ATT'Y.

FIG. 8



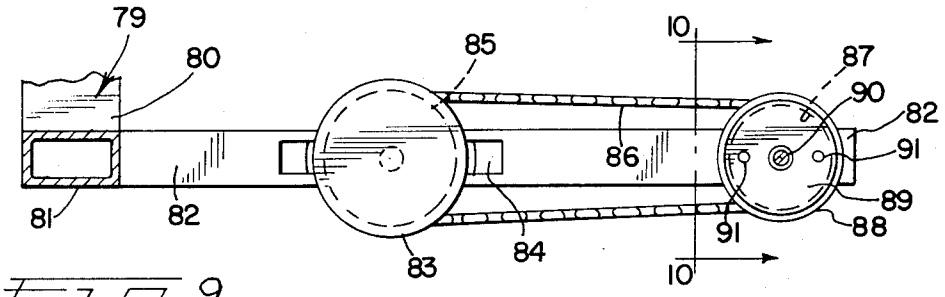


FIG. 9

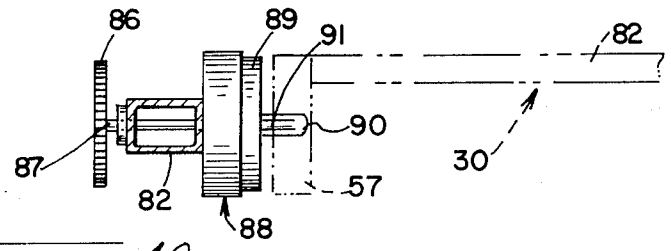


FIG. 10

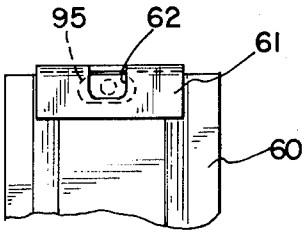


FIG. 11

INVENTOR
WILLIAM L. PRINGLE
BY Edmund O. Vagel
ATT'Y.

RAILWAY CAR

SUMMARY

In copending patent application, Ser. No. 65,461 filed Aug. 20, 1970, by William L. Pringle and Norman T. Bateson an improved railway car is provided which consists of a pair of articulated sections of a railway car, each of which includes an upright narrow truss structure suitably supported on transversely extending stabilizing members connected to conventional trucks in conventional fashion. The truss structure is of relatively narrow design, provides the primary structural support for each of the sections and includes longitudinal and upright beam members of narrow width on which cargo may be supported and suspended. It is a prime object of the present invention to provide an improved structure and method for loading a railway car with cargo by the utilization of fixtures or frames to which the cargo is initially secured and the combination is then suspended on the truss structure. The truss structure is provided with suitable brackets which are interengaged by brackets on the fixture so that the cargo, which may be vehicles, are disposed in hanging relation on opposite sides of the truss structure. The interconnection of the brackets is simple and thus the cargo may also be readily removed by crane or other material-handling means. While the cargo, such as vehicles, may be positioned in various ways in suspended relation on the truss structure the disclosure shows the vehicles suspended in a manner wherein the vertical axis of the vehicle is substantially normal to the sides of the truss structure.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a railway car comprising a pair of articulated sections disclosing one of the sections of the car in an open position;

FIG. 2 is a side elevational view of the railway car disclosed in FIG. 1;

FIG. 3 is a cross-sectional view of a section of a railway car taken along the line 3—3 of FIG. 2;

FIG. 4 is a cross-sectional view taken along the line 4—4 of FIG. 2;

FIG. 5 is a plan view of a fixture or loading frame;

FIG. 6 is a side elevational view of the frame shown in FIG. 5;

FIG. 7 is an elevational end view of the frame shown in FIG. 6;

FIG. 8 is a cross-sectional view taken along the line 8—8 of FIG. 5;

FIG. 9 is a cross-sectional view taken along the line 9—9 of FIG. 3;

FIG. 10 is a cross-sectional view taken along the line 10—10 of FIG. 9; and

FIG. 11 is a view taken along the line 11—11 of FIG. 7.

DETAILED DESCRIPTION

Referring now particularly to FIGS. 1 and 2, a railway car is generally designated by the reference character 10 and includes a pair of articulated sections 11 supported on trucks 12. The sections 11 are suitably connected together by an articulated connection 13 referred to generally, the same being described in greater detail in the aforementioned patent application.

Each articulated section 11 is provided with a vertical truss structure 14 consisting of a plurality of upright beams 15 connected at their upper ends to an upper longitudinal beam 16 and at their lower ends to a lower longitudinal beam 17. The upright beams also are suitably connected to an intermediate beam 18. As shown in FIG. 4, and as more specifically described in the aforementioned patent application, each of the lower longitudinal beams 17 is suitably supported on a horizontally extending stabilizing plate 20, one of which is shown in FIG. 4. The stabilizing plate 20 includes a conventional bolster 21 and side bearing pads 22 and is connected to a truck bolster 23 by means of a conventional center plate 24. Side bearing members 25 are supported on the bolster 23 in conventional fashion for stabilizing the stabilizing plates 20. At opposite ends of the car there are also provided stub center sills 26 which are suitably connected to the stabilizing plates 20 and support conventional couplers 27.

The upright beams are the primary vertical supports of the vertical truss structure 14 but these are further reinforced by vertical supporting beams 28 on which upper brackets 29 are positioned. The brackets 29 are adapted to be connected with suitable fixtures 30 on which vehicles 31 or other cargo are adapted to be mounted so as to suspend the same on the truss structure 14. The fixtures 30 also are secured to the beams 28 by means of lower brackets 30' as best shown in FIG. 4. As best shown in FIGS. 4 and 5, roof beams 32 extend laterally outwardly from opposite ends of the beam 16 and are rigidly secured thereto. The roof beams 32 are provided with laterally extending tracks or slots 33 and each roof beam 32 is provided with a short longitudinally extending portion 34 which includes a slot or track 35 in registry with the transverse slots 33.

As best shown in FIG. 4, the car also includes a lower horizontal covering panel generally designated at 41. The panel 41 does not serve the function, as in the conventional boxcar, of being a structural support since the truss structure 14 substantially serves this purpose. The panel 41 is primarily constructed to provide a lower enclosure to protect the interior of the car and includes a horizontal sheet 42 which is provided with longitudinally extending slots 43 extending on opposite sides of the car 10. Beneath each of the slots 43 there is provided a longitudinal track member 44 suitably connected to the underneath surface of the horizontal sheet 42 which includes longitudinal slot tracks 45 in registry with the slots 43 and the sheet 42. At opposite ends of the lower covering panel 41 there are provided transverse track members 46, as best shown in FIG. 4, which are also provided with slot tracks 47 communicating with the tracks 45 and being in registry with transverse slots 48, shown in FIG. 3, in the horizontal sheet 42. As best shown in FIG. 4, the roof means 32 may be suitably supported by stiffeners 49 which also extend and are suitably connected to the panel 41 for rigidifying the structure.

Folding enclosures 50 are disposed to slide in the slots 33, 35, 40, 45 and 47. The folding enclosures 50 or doors may be of a conventional type of flexible construction and may consist of fiberglass, plastic, or suitable flexible material which permits the enclosures to be compacted together in a stored position, as shown in FIG. 1, wherein the sides of the car are completely ex-

posed so that full access may be had to the interior thereof. Enclosures of this type are quite conventional in building construction and may be in the closed position suitably interlocked by locking members 51 as shown in FIGS. 1 and 2, which of course can be of conventional construction and may be further secured by car seals (not shown). The type of flexible folding enclosures 50 also generally include at their upper and lower ends slide elements 52 which slide in the slot tracks above mentioned.

The fixture or frame 30, shown in FIGS. 5 through 8, comprises a rectangular tubular beam 55 having adjustment openings 56 on opposite sides thereof. The beam 55 is provided at its ends with connector brackets 57 provided with a central opening 58 and laterally disposed openings 59. A pair of transversely extending channel-shaped members 60 are longitudinally supported on the beam 55. Each of said members 60 is provided at its opposite ends with U-shaped hook brackets or hangers 61, also provided with slots 62. A movable attaching frame 63 is slidably supported on the beam 55 and includes a pair of laterally spaced longitudinally extending connector flanges 64 which include openings through which pins 65 are disposed and which engage the adjustment openings 56 to adjustably retain the frame 63 on the beam 55.

The frame 63 includes transversely extending pairs of spaced plates 66 with innermost plates 66 connected to the ends of longitudinally extending channels 67. The plates 66 each are secured to a base plate 66', shown in FIG. 8, which is suitably connected to the beam 55.

Each pair of plates 66 has a pair of air cylinders 68 connected therebetween by means of a suitable connecting bracket 69 as shown in FIG. 8. Each air cylinder 68 is provided with a piston 70 connected to a piston rod 71 which extends through a guide block 72 provided with a suitable bore 73. The end of each piston rod 71 is provided with a flat connector tongue 74, best shown in FIG. 6. The connector tongues 74 are adapted to engage openings 75 provided in hanger brackets 76 which are suitably connected as indicated in FIG. 6 to the laterally spaced longitudinally extending underframe members 78 of a vehicle 31.

The fixture or frame 30 and a vehicle 31 carried thereon may be suitably moved by means of a crane 79 including upright masts or supports 80 having at its lower end a U-shaped frame 81. The U-shaped frame 81 includes arms 82 on which suitable electric motors 83 are supported by means of brackets 84, shown in FIG. 9. The motors 83 drive sprockets 85 which drive chains 86 in turn rotating sprockets 87 supported on the ends of the arms 82. Each sprocket 87 in turn drives a clutch 88 which in turn drives an axially shiftable clutch plate 89 having a center 90 positioned thereon. The centers 90 are adapted to engage the hole 59 of the fixture 30 and laterally spaced prongs 91 engage the openings 59 to effectuate rotation of the fixture 30, as will be described.

The Operation

As best shown in FIG. 4, the fixtures 30 and vehicles 31 are suspended on the sides of the truss structure 14. During loading the frame or fixture 30 is secured to the longitudinal spaced frame members 78 of an automobile or similar vehicle. The frame members 78 first are assembled with the hanger brackets 76 by the attachment of fasteners or bolts 77. The frame 55 is then disposed underneath the vehicle and the tongues 74 are placed in alignment with the openings 75 of the hanger brackets 76. The valve 92 as shown in FIG. 8 is connected to a suitable source of air pressure and air passes through hoses 93 into the cylinder 68 whereby the pistons 70 are retracted against the force of the springs 94 to compress the same. This withdraws the piston rods 71 and upon proper registry of the tongues 74 with the openings 75 the air is exhausted from the cylinder 68 whereupon the springs 94 force the tongues 74 into engagement with the hanger brackets 76 thus locking the frame 30 to the underframe member 78 of the automobile or similar vehicle. As shown in FIG. 6, the pins 65 are provided so that the frame 63 may be adjusted longitudinally along the member 55 as may be desired to accommodate the fixture 30 to various length automobiles. Thus by the simple connection described hereinabove the fixture is locked in position on the frame of the car and is now ready for loading.

A suitable overhead crane or ground-driven loading vehicle, as indicated in FIG. 3, is now driven alongside the fixture and automobile in a manner wherein the centers 90 and prongs 91 are in registry with the openings 58 and 59 of the connector brackets 57. The clutch 88 may be of an electrically actuated type of conventional design wherein upon energization the axially shiftable clutch plate 89 is shifted so that the centers 90 and prongs 91 are in engagement with the connector brackets 57. Thus the crane 79 now is in engagement for raising the fixture 30 and vehicle 31. As the vehicle is being raised from the ground, simultaneously the synchronous motors 83 actuate the sprockets 85, chains 86 and sprockets 87 to pivot the car about its longitudinal axis into the position indicated in FIG. 3, that is, from an upright position the car is now turned on its side and the crane is placed into proximity with the sides of the truss structure 14. The operator lines up the brackets 61 with the brackets 29 and 30' and literally hangs the fixture 30 onto the brackets 29 as indicted in FIG. 4. The vertical axes of the cars are thus positioned substantially normal to the truss structure 14 though it is apparent that the cars may be similarly suspended in other positions. The lower portions of the fixtures 30, as shown in FIG. 4, have their hook brackets 61 in engagement with the lower bracket 30' which is provided at its end with a ball 95 which is hooked into the inner side of the hook brackets 61 by virtue of the fact that the ball 95, as shown in FIG. 11, is larger in diameter than the slot opening 62 provided in each of the brackets 61. Thus by raising the fixture 30 by means of the crane, the fixture 30 is unhooked simultaneously from the brackets 29 as well as the brackets 30', the slots 62 accommodating this vertical lifting from the bracket structure.

Thus it is clearly disclosed that the fixtures are readily attachable to the underframe of a vehicle which in turn can then quickly and easily be handled into a position where it is suspended on the sides of the truss structure. While a separate fixture or frame has been disclosed it is of course contemplated that the attaching structure may be a permanent part of the automobile understructure including the type of bracket disclosed

whereby a crane may attach the vehicles to the truss structure with the bracket portions remaining on the automobile underframe structure.

What is claimed is:

1. A railroad car comprising:

a longitudinally extending upright truss structure mounted centrally and longitudinally of the car;

a plurality of vehicle fixture supporting brackets mounted on said truss structure; and

a pluraliry of vehicle supporting fixtures each including

a longitudinally extending frame element having at least one transverse hanger adapted to be releasably connected to said supporting brackets,

a movable attaching frame slidably mounted on said frame element,

hanger brackets adapted to be couplable with portions of a vehicle undercarriage,

drive means mounted on said movable attaching frame and adapted to drivingly engage said hanger brackets, and

said frame element having end portions adapted for rotative connection with an associated vehicle hoisting means whereby vehicles attached to said fixtures are elevated, rotated and hung on said supporting brackets by said fixtures.

2. The invention according to claim 1 wherein said at least one transverse hanger includes spaced pairs of arms extending on both sides of said longitudinally extending frame element, and

releasable clamping means on the free ends of said arms and adapted to clampingly engage said supporting brackets.

3. The invention according to claim 1 further comprising

means to adjustably secure said movable attaching frame to said frame element.

4. The invention according to claim 1 further comprising

means to releasably secure said hanger brackets to portions of a vehicle undercarriage.

5. The invention according to claim 1 wherein said drive means comprises

transversely extending tongues adapted to engage in corresponding openings in said hanger brackets, and

motor means adapted to move said tongues transversely of said frame element.

6. The invention according to claim 5 wherein said motor means is a fluid actuated motor.

* * * * *