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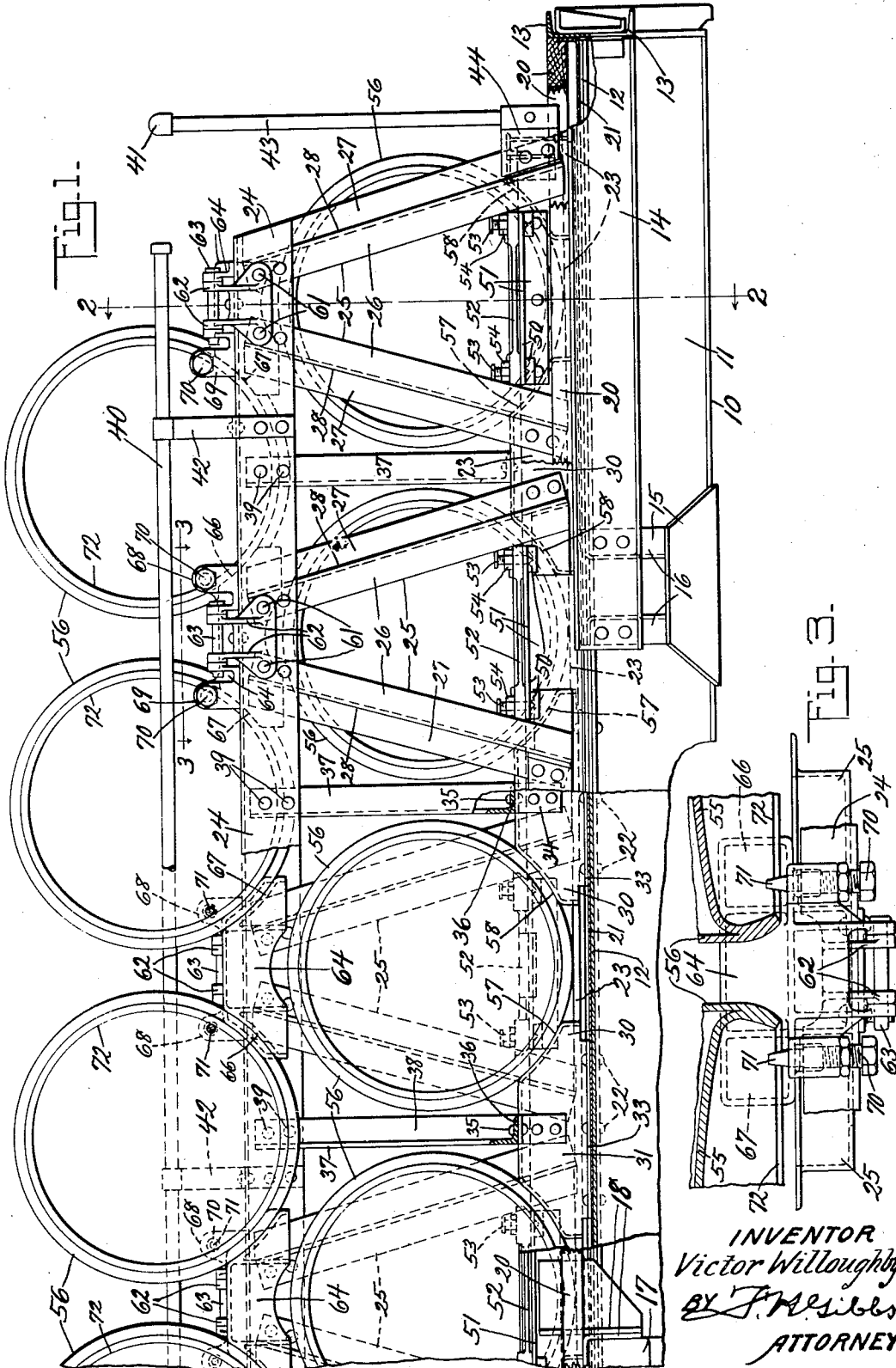
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MULTIPLE UNIT TANK CAR

Filed Feb. 24, 1932

2 Sheets-Sheet 1



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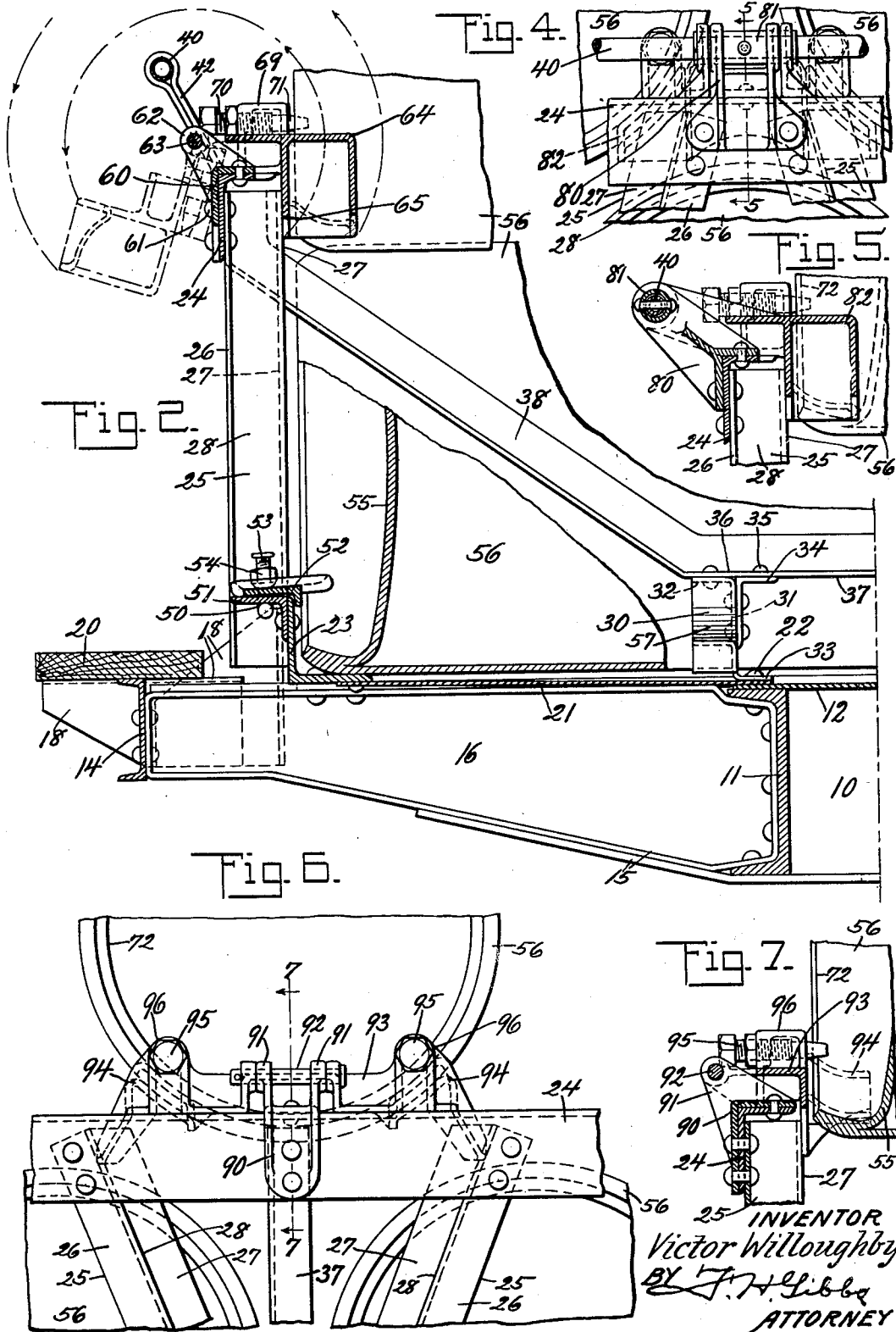
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UNITED STATES PATENT OFFICE

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MULTIPLE UNIT TANK CAR

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Application February 24, 1932. Serial No. 594,825

24 Claims. (Cl. 105—360)

This invention relates to multiple unit tank cars and with regard to certain more specific features thereof to cars adapted to support rows of transversely arranged tanks such as are ordinarily used for the transportation of fluids.

The invention has for one of its objects to provide an inexpensive and sturdy underframe and superstructure adapted to support tanks horizontally arranged transversely of the car in rows, one over the other, and to further provide seating and securing means for the tanks whereby each tank is spaced from adjacent tanks and can be conveniently reached and handled in the operations of loading or unloading the tanks on or from the car.

Another object of the invention is in the provision of a strong and well balanced superstructure combined with seating means for an upper row of tanks, which seating means, though movable to facilitate loading and unloading of tanks of a lower row on or from the car, is nevertheless rigid in the performance of the seating function.

A further object of the invention is to provide anchoring means for the seated or cradled tanks, which are quickly and conveniently operable to engage the chimes of the tanks and to wedge each tank firmly against its seat or seats whereby all of the tanks of each row are securely held against lateral or longitudinal shifting and against rolling movement and the tanks of the upper row are not dependent for their support or seat on the tanks of the lower row.

Still another object according to one embodiment of the invention is to include the hand rail of tank cars as a part of the frame superstructure in such manner that it may function in the mounting of the movable seats for the tanks of the upper row.

Other objects will be in part obvious and in part pointed out particularly hereinafter.

The invention accordingly consists in the various features of construction, combinations of elements and arrangements of parts which will be exemplified by the construction hereinafter set forth and the scope of the application of which will be indicated in the appended claims.

In the accompanying drawings wherein are shown three of various possible embodiments of the invention:

Figure 1 is a view in side elevation of part of a multi-unit tank car embodying the invention. At the left-hand end of the figure the side structure is broken away to show more clearly the manner of seating the tanks of the lower row.

Fig. 2 is a view in cross section taken substantially on the line 2—2 of Fig. 1, the section, however, including only a portion of the first tank of the lower row, in order that the seating structure may be more apparent in the illustration.

Fig. 3 is a fragmentary view in cross section taken substantially on the line 3—3 of Fig. 1.

Fig. 4 is a view in side elevation of seating and securing means for tanks of the upper row according to a modified form of the invention.

Fig. 5 is a view in cross section taken on the line 5—5 of Fig. 4.

Fig. 6 is a view in side elevation of seating and securing means for tanks of the upper row according to another modification of the invention, and

Fig. 7 is a view in cross section taken on the line 7—7 of Fig. 6.

In carrying out the invention according to the embodiment illustrated by Figs. 1 to 3, inclusive, of the drawings, an underframe is provided comprising the center sill 10 formed by spaced channels 11 connected by a top web plate 12. The center sill is suitably connected at either end to end sills 13 which in turn connect with side sills 14 extending on opposite sides of the car from each end sill to and beyond a bolster 15. The latter comprises pressed connections 16 suitably secured at their inner ends to the channels 11 and at their outer ends to the side sills 14. Cross bearers 17 preferably of pressed steel extend outwardly from the center sill and include angle brackets 18 which serve with the side sills 14 and the end sills to locate and support a running board 20 extending continuously around the car.

The car is provided with a floor 21, preferably of steel plate, secured to the center sill as indicated at 22 and supported by the transverse members referred to comprising the bolsters and cross bearers and secured along its outer margin to longitudinal angle members 23 and to the end sill 13. The members 23 extend substantially the entire length of the car on opposite sides and form the lower chords of truss frames of the frame superstructure. The upper chords of the truss frames are longitudinal angle members 24 and are connected to the members 23 by upright or diagonal struts 25 in the form of Z-bars having oppositely directed flanges 26 and 27 and webs 28. Each Z-bar has its flange 26 riveted at the top to the inner side of the angle member 24 and its flange 27 riveted at the bottom to the outer side of angle member 23.

Tank seats 30 are mounted on the underframe and spaced longitudinally as clearly shown in Fig. 1 of the drawings. In the embodiment shown these tank seats are of pressed steel having a web 31, a flange 32 and an inwardly turned lower flange 33 which is secured by the same rivets 22 which fasten the flooring 21 to the upper flanges of the channels 11. The web 31 of each tank seat has riveted thereto an angle member 34 which in turn is riveted as indicated at 35 to a horizontal portion 36 of a brace 37. The brace extends diagonally outward at either side as indicated at 38 to a point of connection 39 with the angle members 24 of the opposite side trusses. Side and end hand-rails are indicated at 40 and 41, respectively, the side hand-rails being supported by brackets 42 riveted to the longitudinal angle members 24 and the end hand-rails being suitably supported by posts 43 on brackets 44 connected to the lower chords 23 of the truss frames as shown in Fig. 1.

Anchors 50 are associated with the lower chords 23 of the truss frames and comprise angle bars 51 riveted to the members 23 and having mounted thereon clamping device 52 operated by bolts 53 and nuts 54 to engage the inner surfaces of the chime 55 at the end of tank 56 of the lower row to bear against different portions of said chime and exert a wedging action on the tank, urging it toward the oppositely disposed seat portions 57 and 58 provided by adjacent seats 30. In practice it has been found desirable to arrange the inwardly projecting legs of the angle members 23 to engage the seated tank at its ends so that the clamping and wedging action of the anchor means on the tank chimes may bind the tank against the inwardly projecting legs of the angle members. Spaced along the upper chords 24 of the side truss frames are brackets 60, preferably castings, formed to fit over the angle member 24 and be riveted thereto as indicated at 61 (see Fig. 1). The castings are provided with spaced ears 62 to receive hinge pins or pivots 63 by which movable tank seats 64 are pivotally connected for swinging movement from the dotted line position shown in Fig. 2 to the full line position shown in the same figure where inner faces 65 of the seat members are brought to bear against flanges 27 of upstanding Z-bars 25.

Each seat casting 64 is formed with arcuate seating portions 66 and 67 into which portions of adjacent tanks are adapted to seat. Obviously, the seat castings 64 at either end of the car need have but one seating portion. The seat castings are further provided with upstanding lugs 68 and 69 each of which is provided with a threaded bolt 70 having a tapered end 71. The arrangement of the lugs is such that as the bolts are turned up through the threaded lugs the tapered ends engage the inner edges 72 of the chimes of adjacent tanks and urge the tanks by wedging action toward their respective seats.

It will be apparent that the present invention comprises a car frame to which a superstructure is secured; the latter comprising oppositely arranged truss frames which define a lading zone therebetween for receiving tanks, the truss frames being connected by braces 37 secured to tank seats 30 which latter, in effect, form a part of the superstructure.

By the described arrangement of seating and anchoring means for the upper row of tanks withdrawal of the tanks is permitted when the anchor bolts are unscrewed. After the upper

tanks have been withdrawn the seating means may be swung transversely on their longitudinal pivots to clear the space between the side trusses for removal of the tanks of the lower row. The tank seats 64 when in tank supporting position project into the lading zone of the car but they are pivotally mounted so that they may be swung on their pivots out of said lading zone to permit removal of the lower tanks; this, of course, subsequent to the removal of the upper tanks from the car.

In the embodiment of the invention shown in Figs. 4 and 5 of the drawings the underframe is substantially as described in connection with the showing in Figs. 1 to 3. The superstructure of the frame, however, is modified to the extent of extending the side hand-rails 40 through brackets 80 which are in other respects similar to the brackets 60. In this embodiment the pivot pins 63 may be eliminated and the hand-rail 40 may serve as the hinge pin or pivot, either directly or through a fixed sleeve 81, for a seating member 82 otherwise similar to the seating member 64.

In the embodiment of the invention shown in Figs. 6 and 7 of the drawings the frame, comprising the underframe and superstructure, is substantially the same as that shown in Figs. 1 to 3, inclusive, but the seating members and anchor devices for the upper row of tanks are modified by employing a bracket 90 having ears 91 and a hinge pin or pivot 92 which pivotally mounts a seating member 93 having seating portions 94 which engage opposite sides of the same tank at the ends thereof, rather than the sides of adjacent tanks as in the previously described embodiment. The anchorage device is also modified to have spaced tapered end bolts 95 threaded through lugs 96 to engage with different portions of the inner edge of the tank chime rather than with edges of adjacent tank chimes as in the embodiment previously described. The manner of swinging the seating members 93 into and out of seating position is substantially the same as in the other forms of the invention. It will be noted also that the seating member 93 when swung into seating position bears against the flanges 27 of Z-bars 25 as in the previously described embodiment.

The car is intended for use particularly with a multiplicity of small tank units which are customarily transferred to an auto truck for final transportation. The ease of manipulation of the anchoring devices and the movable seats renders it well suited to this system of delivery. As the upper row of tanks is supported by the truss frames, which also serve in the support of the lower row, the load is distributed rather than being highly concentrated on the center sill.

What is claimed is:

1. In a multi-unit tank car, a frame, means on said frame adapted to support a row of transversely extending tanks, means pivoted longitudinally on said frame adapted to cradle a row of transversely extending tanks above the first said row and independently thereof.

2. In a multi-unit tank car, an underframe having side and center sills and a superstructure comprising a plurality of struts rising upwardly from the underframe at either side of the car, longitudinal members connected to the upper ends of the struts, means for seating a row of tanks on the center sill, and seats mounted on said longitudinal members for a row of transversely extending tanks spaced above the tanks of the first said row.

3. In a multi-unit tank car, an underframe, means thereon for supporting a row of transversely extending tanks, a superstructure supported by said underframe, and a plurality of sets of tank end seats pivoted longitudinally on said superstructure at opposite sides so as to seat a row of tanks spaced above the first said row and also be withdrawn from seating position.
4. In a multi-unit tank car, an underframe, means thereon for supporting a row of transversely extending tanks, a superstructure supported by said underframe, and a plurality of sets of tank end seats movably mounted on said superstructure at opposite sides so as to seat a row of tanks spaced above the first said row and also be withdrawn from seating position, each set of seats comprising opposite side members pivoted longitudinally on the superstructure and having seating portions for engagement with the sides of adjacent tanks at their end regions.
5. In a multi-unit tank car, an underframe, means thereon for supporting a row of transversely extending tanks, a superstructure supported by said underframe, and a plurality of sets of tank end seats movably mounted on said superstructure at opposite sides so as to seat a row of tanks spaced above the first said row and also be withdrawn from seating position, each set of seats comprising opposite side members pivoted longitudinally on the superstructure.
6. In a multi-unit tank car, an underframe, means thereon for supporting a row of transversely extending tanks, a superstructure supported by said underframe, and a plurality of sets of tank end seats movably mounted on said superstructure at opposite sides so as to seat a row of tanks spaced above the first said row and also be withdrawn from seating position, said superstructure comprising a hand rail, and each set of seats comprising opposite side members pivotally movable around said hand rail.
7. In a multi-unit tank car, an underframe, means thereon for supporting a row of transversely extending tanks, a superstructure supported by said underframe, and a plurality of sets of tank end seats pivotally connected to said superstructure at opposite sides in such a manner as to seat a row of tanks spaced above the first said row and also be withdrawn from seating position, and means for anchoring the tanks in seated position.
8. In a multi-unit tank car, an underframe, means thereon for supporting a row of transversely extending tanks, a superstructure supported by said underframe, and a plurality of sets of tank end seats movably mounted on said superstructure at opposite sides so as to seat a row of tanks spaced above the first said row and also be withdrawn from seating position, each set of seats comprising opposite side members pivoted to the superstructure to swing inwardly toward each other, and means for anchoring the tanks in seated position.
9. In a multi-unit tank car, an underframe, means thereon for supporting a row of transversely extending tanks, a truss frame supported by said underframe at each side thereof, and a plurality of sets of tank end seats pivotally connected to said truss frames in such a manner as to seat a row of tanks spaced above the first said row and also be withdrawn from seating position, each set of seats comprising opposite side members having seating portions for engagement with the sides of adjacent tanks at their end regions, and means for anchoring the tanks in seated position.
10. In a multi-unit tank car, an underframe, means thereon for supporting a row of transversely extending tanks, truss frames supported by said underframe at opposite sides thereof, and a plurality of sets of tank end seats pivotally connected to said truss frames so as to seat a row of tanks spaced above the first said row and also be withdrawn from seating position, and tapered-end bolts carried by the seats adapted to wedgingly secure certain of the tanks in seated position.
11. In a multi-unit tank car, an underframe, means thereon for supporting a row of transversely extending tanks, a superstructure supported by said underframe, and a plurality of sets of tank end seats movably mounted on said superstructure at opposite sides to swing transversely so as to seat a row of tanks spaced above the first said row and also be withdrawn from seating position, each set of seats comprising opposite side members pivotally mounted on the superstructure and having seating portions for engagement with the side of a tank at the opposite end regions thereof.
12. In a multi-unit tank car, tank seat elements for transversely extending chimed tanks and means for holding the tanks securely against the seats comprising bolts adjustably mounted in said tank seat elements for movement toward and from the tanks and having tapered ends which act on the chimes of the tanks to wedge the tanks toward the seats.
13. In a multi-unit tank car, tank seat elements for transversely extending chimed tanks, bolt supports on the tank seat elements, and means for holding the tanks securely against the seats comprising pairs of tapered-end bolts adjustable in said supports for movement toward and from the tanks and arranged so that the tapered ends respectively co-act with the chimes of adjacent tanks to wedge them toward their seats.
14. In a multi-unit tank car, tank seat elements for transversely extending chimed tanks, said elements having bolt supports and means for holding the tanks securely against the seats comprising pairs of tapered-end bolts threaded in said supports for movement toward and from a tank and arranged so that the tapered ends co-act respectively with spaced portions of the tank chime to wedge the tank toward its seat.
15. In a multi-unit tank car, a frame, means on said frame adapted to support a row of transversely extending tanks, means longitudinally pivotally mounted on said frame adapted to cradle a row of transversely extending tanks above the first said row and independently thereof, and means for securing the tanks of both rows in supported and cradled position.
16. In a multi-unit tank car, a frame comprising an underframe having side and center sills and a superstructure comprising upwardly extending struts at either side and longitudinal members connected to the upper ends of the struts and extending substantially the length of the car, means on the center sill for cradling a row of tanks, seats mounted on said longitudinal members for a row of transversely extending tanks spaced above the tanks of the first said row, and tank securing means adapted to engage the ends of the tanks of both rows.
17. In a multi-unit tank car, a frame comprising an underframe having a center sill, end sills, and side sills, and a superstructure comprising up-

per and lower longitudinal members at each side of the car connected by spaced struts, seat members connected to the center sill whereby a row of transversely extending tanks may be seated at their central regions with their ends over the said lower longitudinal members, and braces connected to the seat members and extending transversely to a connection with the upper longitudinal members, in combination with means supported by said superstructure for seating an upper row of tanks.

18. In a car construction, a truss frame constituting one side of the lading zone of the car and comprising an upper member, and tank seats pivotally connected to said upper member.

19. In a car construction, a truss frame constituting one side of the lading zone of the car and comprising an upper member, and tank seats pivotally connected to said upper member in such a manner as to be capable of pivotal movement into and out of the lading zone.

20. In a railway car, spaced rigid frames defining the lading zone of the car therebetween, and tank seats pivotally secured to the upper portions of said frames and normally extending into the lading zone of the car.

21. In a railway car, spaced rigid frames defining the lading zone of the car therebetween, and tank seats pivotally secured to the upper portions of said frames in such a manner as to be shiftable on their pivots into and out of the lading zone of the car.

22. In a railway car, an underframe, and a superstructure thereon for supporting tanks comprising oppositely arranged frame members, means including tank seats arranged adjacent the longitudinal center line of the car connecting said frame members, and tank seats pivotally secured to the upper portions of the frame members in such a manner as to be shiftable to opposite sides of said members.

23. In a railway car, an underframe, and a superstructure mounted on the underframe for supporting tanks comprising oppositely arranged frame members extending vertically upward from the underframe and constituting side portions for the lading zone of the car, means connecting said frame members, tank seats supported on the underframe adjacent the longitudinal center line of the car for supporting a lower row of tanks, and tank seats pivotally secured to the upper portions of the frame members and adapted to extend into the lading zone of the car for supporting an upper row of tanks, said second named tank seats being so pivoted as to be swung outside of the lading zone.

24. In a railway car, spaced truss frames defining the lading zone of the car therebetween and each including rigid members extending longitudinally of the car, and tank seats pivotally secured to the rigid members in such a manner as to be shiftable into and out of the lading zone.

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