April 15, 1930. V. WILLOUGHBY 1,754,450

MULTIUNIT TANK CAR

Filed Oct. 26. 1928 3 Sheets-Sheet 1

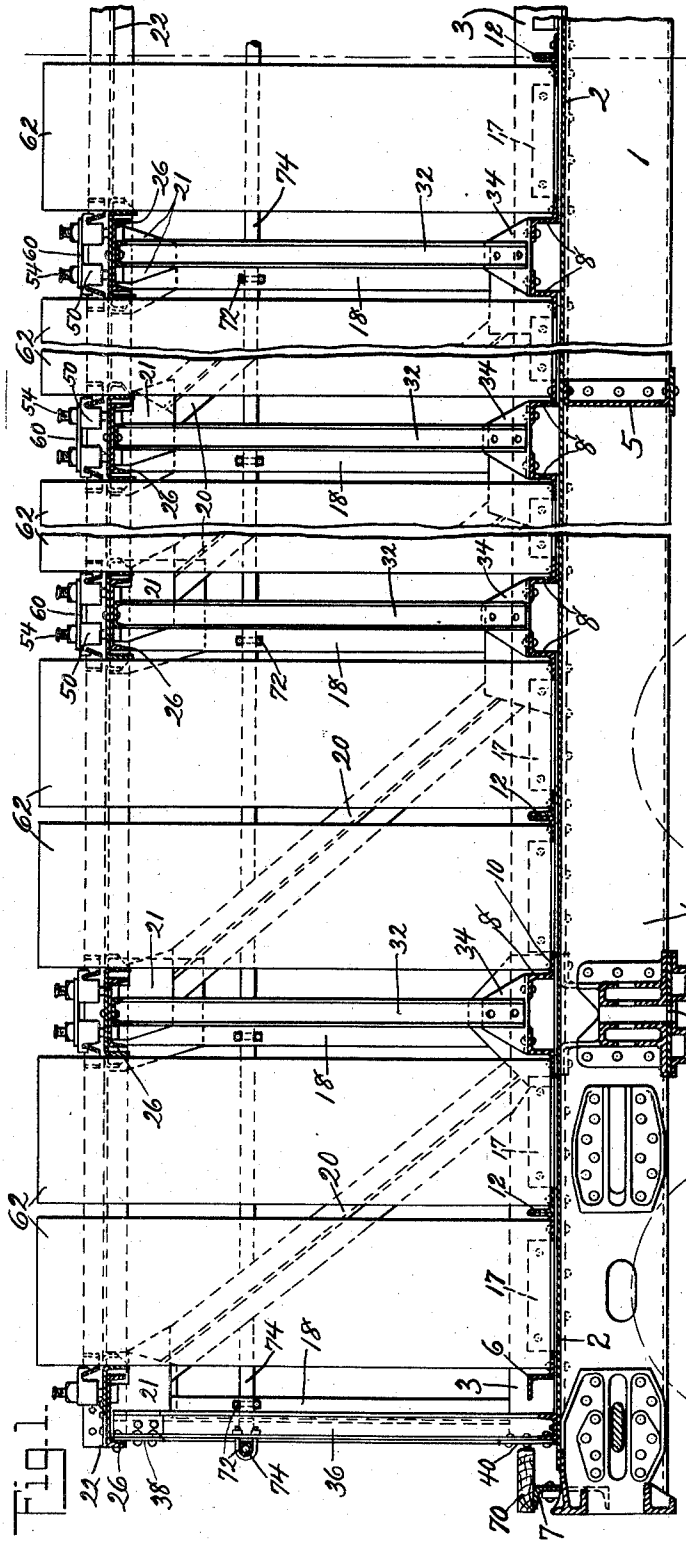


Fig. 1.

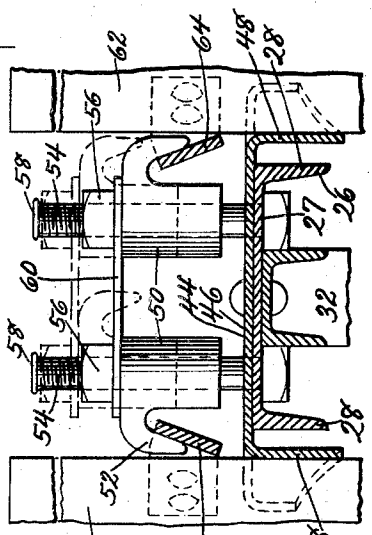


Fig. 4.

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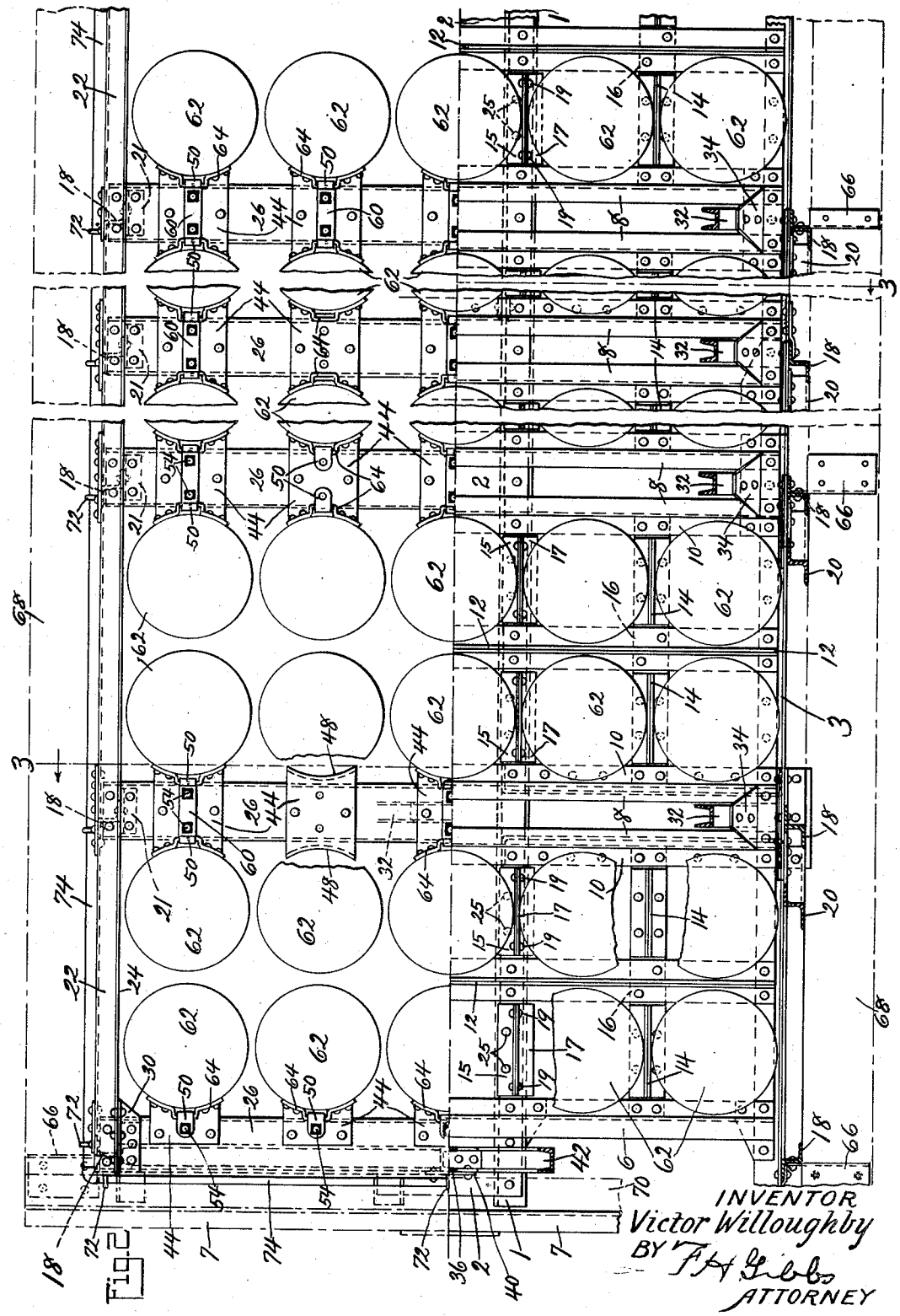


Fig. 2

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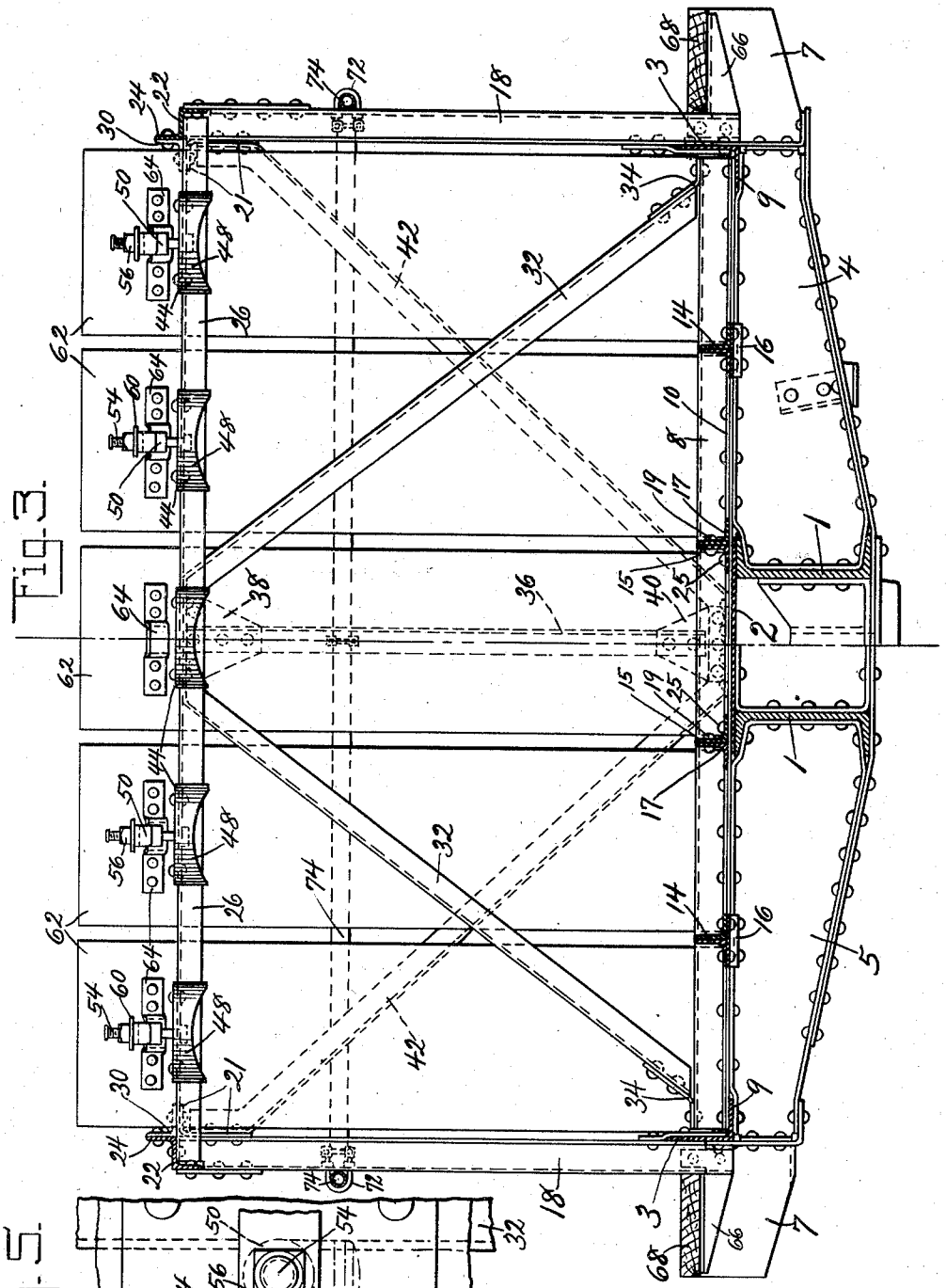


Fig. 3.

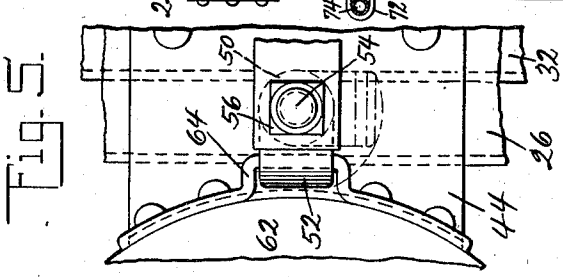


Fig. 5.

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UNITED STATES PATENT OFFICE

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MULTIUNIT TANK CAR

Application filed October 26, 1928. Serial No. 315,233.

This invention relates to tank cars and more particularly to tank cars of the type in which a plurality of separate, detachable tanks are carried, and it is an object of this invention to provide an improved car of the type described having a plurality of vertically arranged detachable tanks, and it is also an object of this invention to provide in a car of the type described improved means for supporting and securing the tanks in position, which will withstand the strains of service, be of simple and economical construction and permit of the tanks being readily removed or placed. With these and other objects in view, as will appear more fully hereinafter, the invention consists substantially in the construction, combination, location and relative arrangement of the parts all as will be more fully herein set forth, as shown in the accompanying drawings and finally pointed out in the appended claims.

In the drawings:

Figure 1 is a broken, partial, vertical, longitudinal section of a tank car constructed in accordance with this invention;

Fig. 2 is in part a broken top plan view and in part a broken horizontal section of the structure shown in Fig. 1, the tanks being shown in plan and parts being broken away to show other parts more clearly;

Fig. 3 is a vertical transverse section taken on the line 3—3 of Fig. 2;

Fig. 4 is a fragmentary vertical section showing the means for securing the tanks in position; and

Fig. 5 is a fragmentary top plan view showing part of the securing means shown in Fig. 4.

In the drawings the car shown comprises an underframe consisting of a center sill formed of channels 1 joined by a top cover plate 2, angle side sills 3, bolsters 4, cross bearers 5, and end sills 7. Adjacent the ends of the underframe are Z-bars 6 placed with their webs vertical. The bars 6 extend from side sill to side sill and have their inwardly projecting bottom flanges secured to the inwardly projecting flanges 9 of the side sills and to the top cover plate 2 of the center sill. At regular intervals between the Z-bars 6 are pairs of spaced Z-bars 8, placed with their webs vertical and their bottom flanges 10 projecting away from each other. The Z-bars 8 extend from side sill to side sill and have their bottom flanges secured to the inwardly projecting flanges 9 of the side sills and to the cover plate 2 of the center sill. Intermediate the Z-bars are placed pairs of angles 12, which are arranged back to back and with their horizontal flanges projecting outwardly. The angles 12 extend from side sill to side sill, and have their horizontal flanges secured to the flanges 9 of the side sills and to the cover plate 2 of the center sills. Extending longitudinally of the car and intermediate the center and side sills are spaced pairs of angles 14 placed back to back with horizontal flanges projecting outwardly. The angles 14 extend between the bottom flanges of the transversely arranged Z-bars and angles and are secured thereto by tie-plates 16. Extending longitudinally of the car at the center sill are spaced pairs of angles 15 and 17, placed back to back, with their horizontal flanges projecting outwardly. The angles 15 and 17 extend between the bottom flanges of the transversely arranged Z-bars and angles, and are fastened back to back by rivets 19, each pair being secured to the center sill by rivets 25 in the horizontal flange of angle 15. The arrangement of transverse Z-bars and angles, the longitudinal angles and the sills 3, it will be noted, provides a plurality of rectangles, the sides of which have inwardly projecting flanges.

To the side sills 3 of the car are secured posts 18 and diagonal braces 20, the upper ends of which are attached to longitudinal Z-bars 22 placed with their webs horizontal and their flanges vertical. The Z-bars 22 and the posts 18 and braces 20, together with the side sills 3, form trusses which constitute the side frames of the car. At their ends and at points over the spaced Z-bars 8, the side frames are connected by channel cross members 26 placed with their webs 27 horizontal and their flanges 28 projecting downwardly, the channels 26 extending in under the webs of the Z-bars 22 and being secured thereto. The channels 26 are also secured to the inner

flanges of the posts 18 and diagonal braces 20 by angle gussets 21, and the end channels 26 are further secured to the ends of flanges 24 of the Z-bars 22 by means of short angles 30. The intermediate cross members 26 are braced at their centers by continuous channel braces 32 which extend from the center points of the channels 26 to the ends of the Z-bars 8, and are secured to the Z-bars 8 by means of gusset plates 34. The end cross members 26 are supported at their centers by posts 36 which are connected to the end cross members 26 by gusset plates 38 and to continuous channel braces 42 by gusset plates 40. The ends are further reinforced by the continuous channel braces 42 which are connected to the tops of the end posts 18 and to the center sill cover plate 2.

To each of the cross members 26 is secured a plurality of spaced saddles 44, the saddles attached to the intermediate cross members 26 projecting on both sides of the cross members, while the saddles attached to the end cross members project inwardly only. Each saddle comprises a horizontal web 46 and a downwardly extending flange 48 on the projecting portions of the webs, the webs 46 being recessed and the flanges 48 being curved to cylindrical shape. To the cross members 26 at each saddle 44 are secured clamp members 50, there being two clamps attached at each saddle on each intermediate cross member 26 and one clamp attached at each saddle on the end cross members 26. Each clamp member 50 is provided with a hook portion 52 and is pivotally mounted on a bolt 54 which extends through the cross member 26 and the saddle 44, and is provided on its upper threaded end with a nut 56 secured thereon by upsetting the end 58 of the bolt. At each of the saddles on the intermediate cross members 26 the bolts 54 are connected by a tie-plate 60 which tends to prevent shifting of the clamp members 50. Rotation of the bolts 54 is prevented by engagement of the squared heads thereof with the braces 32 or the flanges of the cross members 26.

In each of the rectangles formed by the Z-bars and angles is placed a vertically arranged tank 62, the bottom of the tank resting on the inwardly projecting flanges of the sides of the rectangle, and fitting the curved flange 48 of the saddle 44. To each of the tanks 62 there is secured a bracket 64, by riveting or other suitable means, the bracket 64 being positioned to be engaged by the hook portion 52 of the clamp member 50 so that upon tightening of the nuts 56 the tanks will be securely held in position on the flanges of the sides of the rectangles and against the flanges 48 of the saddles 44.

At intervals along the sides of the car, brackets 66 are attached at the bottoms of the posts 18 and support running boards 68, the side running boards being joined at the ends of the car by running boards 70 mounted on the end sills 7. To the side posts 18 U-bolts 72 secure a hand-rail 74, the hand-rail 74 being extended across the ends of the car and supported from the end posts 36 in like manner.

It will be clear that by loosening the nuts 56 and raising the clamp members 50 the hook portions 52 may be turned to the position shown in dotted lines in Fig. 4, in which position of the clamp members the tanks 62 may be freely removed from the car or placed in position on the car. With the tanks in position on the car the clamp members 50 are turned to the positions in which they will engage with the brackets 64 on the tanks and the nuts 56 tightened, thus securing the tanks in position. While the preferred form of the invention has been shown and described, it is to be understood that the invention is not limited to the exact details of construction shown and described, as it is obvious that various modifications thereof within the scope of the claims will occur to persons skilled in the art.

What is claimed is:

1. In a tank car, longitudinal sills, transverse members having inwardly directed flanges extending between said sills, longitudinal members having inwardly directed flanges extending between said transverse members and vertically arranged tanks mounted upon the inwardly directed flanges of said members.

2. In a tank car, longitudinal sills, longitudinally and transversely extending members carried by said sills and having inwardly directed flanges and vertically arranged tanks mounted on said flanges.

3. In a tank car, longitudinal sills, longitudinally and transversely extending members cooperating with said sills to form a plurality of transverse rows of rectangles with sides having inwardly directed flanges and a vertically arranged tank mounted on the inwardly directed flanges of each rectangle.

4. In a tank car having side frames, a plurality of vertically arranged tanks between said side frames, spaced cross members joining said side frames, brackets attached to said tanks and clamps attached to said cross members and engaging said brackets to secure said tanks in position.

5. In a tank car having side frames, a plurality of transverse rows of vertically arranged tanks between said side frames, spaced cross members joining said side frames and extending between rows of said tanks and cooperating means on said cross members and tanks for securing said tanks in position.

6. In a tank car having side frames, a plurality of tanks between said side frames, spaced cross members joining said side frames and cooperating means on said cross members and tanks for securing said tanks in position.

7. In a tank car having side frames, a plurality of vertically arranged tanks between said side frames, spaced cross members joining said side frames and means securing said tanks to individual cross members.

8. In a tank car having side frames, a plurality of vertically arranged tanks between said side frames, spaced cross members joining said side frames and dividing said tanks into groups and cooperating means on said cross members and tanks for securing said tanks in position.

9. In a tank car having side frames, a plurality of transverse rows of vertically arranged tanks between said side frames, spaced cross members joining said side frames and extending between rows of tanks, brackets on said tanks and clamps on said cross members engaging said brackets to secure said tanks in position.

10. In a tank car having side frames, a plurality of transverse rows of vertically arranged tanks between said side frames, spaced cross members joining said side frames, brackets on said tanks, clamps on said cross members engaging said brackets to secure said tanks in position and means connecting said clamps in pairs.

11. In a tank car having side frames, a plurality of vertically arranged tanks between said side frames, spaced cross members joining said side frames, saddles on said cross members and means securing said tanks to said saddles.

12. In a tank car having side frames, a plurality of vertically arranged tanks between said side frames, spaced cross members joining said side frames, saddles on said cross members, brackets on said tanks and clamps on said cross members engaging said brackets to secure said tanks in engagement with said saddles.

13. In a tank car, an underframe, cross members mounted on said underframe and spaced therefrom, a plurality of vertically arranged tanks and means connecting said tanks to individual cross members.

14. In a tank car, an underframe, cross members mounted on said underframe and spaced therefrom, saddles on said cross members, a plurality of vertically arranged tanks and means connecting said tanks to said saddles.

15. In a tank car, an underframe, cross members mounted on said underframe and spaced therefrom, saddles on said cross members, a plurality of vertically arranged tanks, and cooperating means on said tanks and cross members securing said tanks in engagement with said saddles.

16. In a tank car, an underframe, cross members mounted on said underframe and spaced therefrom, saddles on said cross members, a plurality of vertically arranged tanks, brackets on said tanks and clamps on said cross members engaging said brackets to secure said tanks to said saddles.

17. In a tank car, an underframe having longitudinal sills, longitudinal and transverse members carried by said underframe cooperating with said sills to form a plurality of rectangles with sides having inwardly directed flanges, cross members mounted on said underframes and spaced therefrom, a plurality of vertically arranged tanks mounted on said inwardly directed flanges and means securing said tanks to said cross members.

18. In a tank car, an underframe, members carried by said underframe arranged to form a plurality of rectangles with sides having inwardly directed flanges, cross members mounted on said underframes and spaced therefrom, a plurality of vertically arranged tanks mounted on said inwardly directed flanges and cooperating means on said tanks and cross members securing said tanks in position.

19. In a tank car, an underframe, members carried by said underframe arranged to form a plurality of rectangles with sides having inwardly directed flanges, cross members mounted on said underframe and spaced therefrom, saddles mounted on said cross members, a plurality of vertically arranged tanks mounted on said flanges and cooperating means on said tanks and cross members securing said tanks in engagement with said saddles.

20. In a tank car having side frames, cross members joining said side frames, tanks arranged in transverse rows with a plurality of rows between adjacent cross members, and means securing said tanks to said cross members.

21. In a tank car having side frames, cross members joining said side frames, tanks arranged in rows longitudinally of the car with a plurality of tanks of each row between adjacent cross members, and means securing said tanks to said cross members.

In witness whereof I have hereunto set my hand.

VICTOR WILLOUGHBY.