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MULTIPLE UNIT TANK CAR

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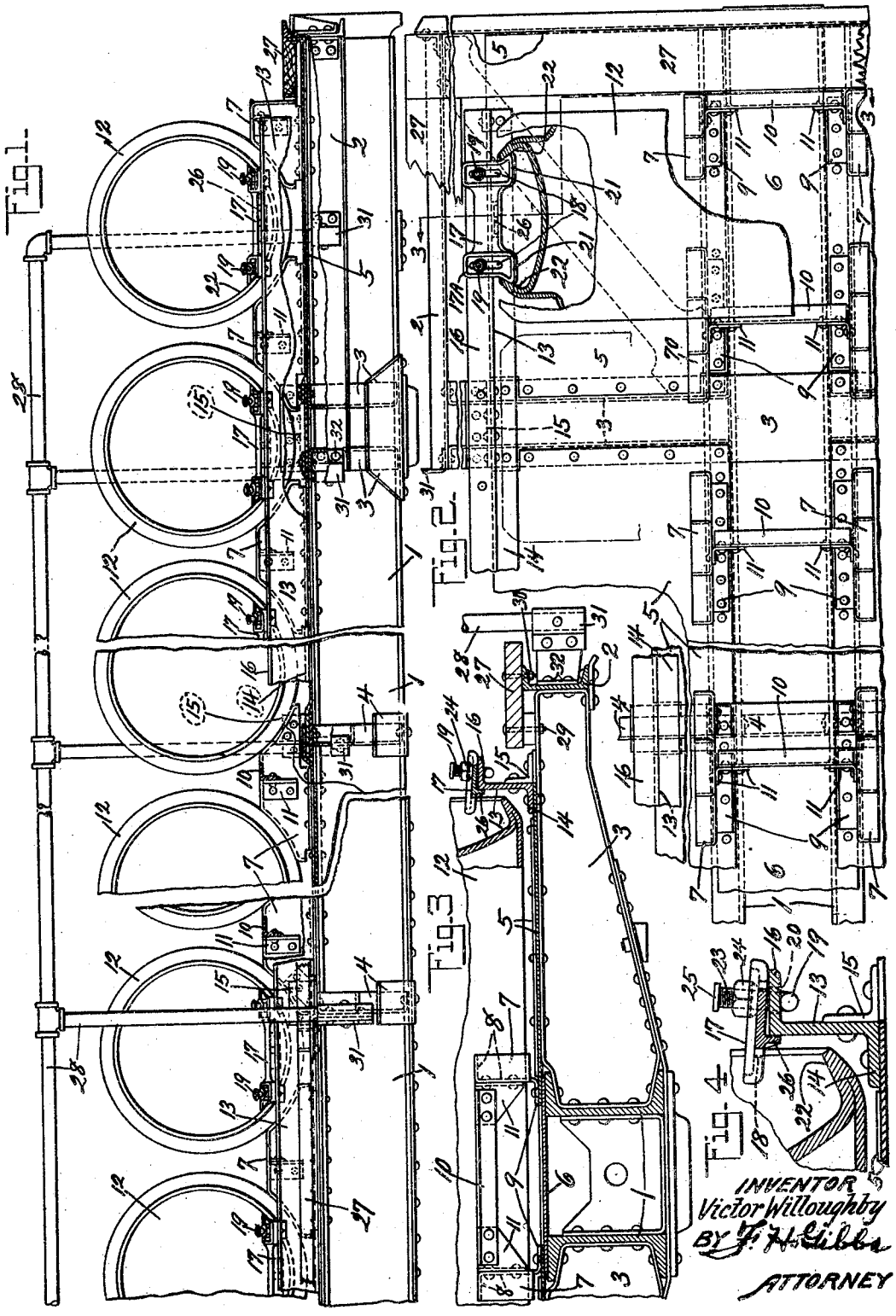

Fig. 1.

Fig. 2.

Fig. 3

Fig. 4

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MULTIPLE UNIT TANK CAR

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This invention relates generally to multiple unit tank cars and more particularly to the arrangement thereon of tanks transversely arranged and such as are customarily used for the transportation and storage of fluids although it will of course be understood that the arrangement of parts and the principles employed herein are applicable to tanks of various sizes, shapes and numbers.

One object of the invention is to provide an improved multi-unit tank car with tanks arranged transversely of the car and supported by cradles arranged over and supported by the center sills.

Another object of the invention is to provide improved means for securing tank units to the tank body such that a multiple unit tank car can be formed by securing tank units to cradles supported by or attached to the center sills of a car of ordinary construction.

It is a further object of the invention to provide improved securing means which may be readily operated to secure or release the tank units, which are of simple and rugged construction, so formed that parts can not be lost when the securing means are not holding tank units in position, and which means may readily be secured to the floor of a car of ordinary construction.

Another object is to provide anchoring means arranged so as not only to facilitate loading and unloading of the tanks but also effectively distribute the anchoring stresses to the car frame.

Other objects and advantages will be more apparent to those skilled in the art by the following description of the accompanying drawing of which:

Fig. 1 is a fragmentary side elevation of a multiple unit tank car with parts broken away and partly in central vertical section, constructed in accordance with this invention;

Fig. 2 is a fragmentary top plan view, parts of one of the tank units being indicated in dotted line and another being shown with parts broken away and partly in section, showing the securing means;

Fig. 3 is a transverse vertical section on a larger scale taken on the line 3—3 of Fig. 2, showing a fragmentary side elevation of one of the tank units, partly broken away and part shown in section, and showing the manner of supporting and securing the tank units to the car body, and

Fig. 4 is an enlarged fragmentary view of the tank unit securing means as shown in Fig. 3.

In the specific embodiments of the invention, which are shown herein merely for purposes of illustration, there is provided a flat car of ordinary construction having a frame comprising a center sill 1, side sills 2, bolsters 3 and cross-bearers 4, and covered by floor sheets 5. The frame is supported on trucks carried by wheels (not shown). Supported by the center sill 1 are the cradle members 7 secured by rivets or other suitable means and, as shown by the drawing, the securing means for the members 7 pass through the floor sheets 5 and the center sill cover plate 6 and are secured to the center sill 1. Each cradle consists of two members 7 and and each member 7 is formed with seats for receiving cylindrical containers with their longitudinal axis arranged transversely of the car. The seats are arranged in sets with the adjacent ends of adjacent sets spaced apart. Each member 7 is formed of a plate, pressed to Z-bar shape, as shown at 8 (Fig. 3) having its lower flange 9 turned inwardly. These Z-shaped plates are formed at their upper portions into seats conforming to the contour of cylindrical shaped container tanks. These plates are joined at the top by the cradle brace 10 which is reinforced and connected thereto by gussets 11. Between the cradle members 7 are placed a plurality of tank units 12 arranged transversely of the car, and while the drawing shows cradles for six tanks, as many cradles and tanks may be used as the length of the car will permit.

To the bolsters 3 and cross-bearers 4 are secured spaced parallel longitudinal members 13 (only one being shown in the drawing as these members are identical) which are formed of Z-bars having their lower flanges 14 (Figs. 3 and 4) turned inwardly and secured to the bolsters 3 and cross-bearers 4 by rivets or other suitable securing means, and

reinforced by the angle bars 15 riveted to them and also to the bolsters 3 and cross-bearers 4. To the upper outwardly projecting flanges 16 of the Z-bars 13 are secured cast securing members or anchors 17 having their outer portions slotted with parallel slots 18 (Fig. 2) to receive the T-shaped bolts 19 which engage in openings 20 in the upper flanges 16 of the members 13. The inner end portions of the anchors 17 have upwardly extending flanges 21 with outwardly flared ends which are shaped to conform with the inner surface of the lip 22 of the head flange of the tank container 12, as clearly shown in Fig. 2. As shown in Fig. 4, the bolt 19, has its upper end threaded at 23 to receive the nut 24, and the upper threaded end is headed, as at 25, to prevent removal of the nut. As shown in Fig. 4 each anchor 17 has an integral flange 26 depending therefrom and arranged in surface contact with the web of the Z-bar and, as shown in the drawing, is adapted, in its secured position, to be held in contact with this web, thereby preventing any movement of the tank units transversely of the car, or rocking of the anchors.

While the drawing shows a construction of a flat car using a floor it can be readily seen that this invention can be also applied to an open frame car.

Extending longitudinally of the car along the ends of the cross beams are the spaced running boards 27 (only one being shown in the drawing as these members are identical) with guard rails 28. As shown in Fig. 3 the running boards are bolted to the cross-bearers and side sills 2, at 29 and 30, respectively. The guard rail 28 is shown mounted in a socket carried by the bracket 31 as shown secured to the side sill 2 at 32 in Fig. 3.

Before attaching the anchor members 17 to the Z-bars 13 the lower ends of two T-shaped bolts 19 are first inserted in the holes 20 in the Z-bar for receiving them. Over the upper or threaded ends of the bolts is fitted the anchor member, the slots 18 receiving the upper ends of these bolts. After the nuts 24 for securing the anchor members are put on, the upper ends of these bolts are headed, as shown at 25, to prevent the nuts from being removed. As shown in Fig. 4 the nuts 24 being larger than the slots 18 prevent the anchor members from being detached, and hence their subsequent loss when not in use.

Assuming the tank units in place on the cradles 7, the anchors 17 (with their nuts 24 loosened) are moved upwardly to a point where the diameter of the tank is greater than the length of member 17, then lowered until the flared ends of their flanges 21 are brought into engagement with the chime 22 of the head flange of the tank unit 12. This is clearly shown in Fig. 2. When the nut 24 is set up the anchor is firmly clamped to the head flange of the tank unit and to the Z-bar 13. In this position it will readily be seen from the drawing (Fig. 4) that the depending flange 26 on the anchor member will be set up firmly against the web 13 on the Z-bar and prevent any end motion of the tanks. It will also be readily seen that the cradle 7 as well as the anchor 17 prevents any motion of the tanks longitudinally of the car so that in their secured position motion in any direction is prevented.

In order to release the tank units the nuts 24 will be unscrewed, releasing the pressure on the anchor member 17 and permitting these members to be lifted to clear the chime of the tank then slid back on the bolts 19 along the slots 18 clear of the head flanges, thus readily permitting removal of the tank units. It will be further noted that the anchors 17 and their securing members are the only members it is necessary to loosen in order that the tank units may be removed from the car. It will also be noted that subsequent loss of these securing members is prevented by the fact that the slot 18 in the anchor 17 is smaller than the nut 24 and the cooperation between the T-shaped bolt and the annular flange 17A on the anchor 17 prevents that bolt from being withdrawn from the hole 20 in the upper flange of the Z-bar 13. The nut 24 is prevented from removal by the headed portion 25 of the bolt 19 clearly shown in Fig. 4.

It is readily seen that the tank units in their secured position in the cradles have their weight supported by the center sill, and in this position their center of gravity will also be located at the center sill. Since this is the point of minimum rolling in the car the rolling moment of the contained fluid will be reduced and this moment and its weight being communicated to the center sill of the car, the arrangement of tank units described in this invention will result in a much more uniform distribution of these forces on the car structure and consequently will reduce the wear and tear on the car which is clearly advantageous.

Attention is called to the direction of the lines of force of the chime engaging ends of the anchors. The anchors are moved downwardly in the securing operation and the spaced ends engage the inner surface of the chime on lower opposite sides. The cradle seats contact with the outer surfaces of lower opposite sides of the tanks directly over the center sill, in full opposition to the pressures exerted by the anchors, whereby the tanks are securely held against rolling, rotating, or bodily shifting in their seats.

While a preferred specific embodiment of the invention is hereinbefore set forth, it is to be understood that I am not to be limited by the exact construction illustrated and described because various modifications of these details may be provided in putting the in-

vention into practice within the purview of the appended claims.

What is claimed is:

1. In a multi-unit tank car, a frame including a center sill, side sills outwardly spaced therefrom, bolsters and cross-bearers, means for cradling a plurality of tanks transversely on said frame, said means comprising cradle frames mounted on the center sill whereby the load strain is transmitted directly to the center sill, and anchor means supported by the bolsters and cross-bearers engageable with the tank ends for forcing the tanks against the cradle frames.

2. In a multi-unit tank car, a frame including a center sill, seating means on the center sill for a row of transversely arranged tanks, the last said means comprising movable anchor members introducible to the tank ends, and moving and securing devices therefor.

3. In a multi-unit tank car, a frame comprising a center sill, spaced seating members on the sill arranged to contact opposite lower sides respectively of chimed tanks positioned transversely of the frame, an anchorage on the frame for each end of each tank comprising a member having spaced engaging ends adapted to contact respectively with the inner surface of lower opposite sides of the tank chime, and means for moving said member to secured position on the frame thereby pressing the tanks against said opposite lower side seats.

4. In a multi-unit tank car including an underframe provided with a center sill, side sills, bolsters and cross-bearers, a plurality of spaced pairs of cradle members secured to the center sill and positioned immediately thereabove, said cradle members being arranged longitudinally of the underframe and being so formed as to provide transversely arranged seats for supporting tanks transversely of the underframe, and anchor members supported by the bolsters and cross-bearers adapted to engage the end portions of the tanks.

5. In a multi-unit tank car including an underframe provided with a center sill, side sills, bolsters and cross-bearers, means for supporting a plurality of tanks transversely of the underframe comprising a plurality of pairs of cradle members secured to the center sill and arranged longitudinally of the underframe, said cradle members being so formed as to provide a plurality of pairs of transversely arranged tank receiving seats, and a rigid element extending between and connecting the cradle members of each pair.

6. In a multi-unit tank car, an underframe including a center sill, cradle members secured to the center sill and arranged longitudinally of the underframe, said cradle members being arranged in spaced pairs and being so formed as to provide alined transversely arranged seating surfaces for receiving and holding tanks transversely of the underframe, and anchor members supported by the underframe and adapted to engage the end portions of the tanks.

7. A cradle unit for multi-unit tank cars comprising a pair of cradle members, Z-shaped in general cross section and each provided with a seating surface and a rigid element extending between and connecting said members to reinforce the latter and to retain the same in spaced relation.

8. A cradle unit for multi-unit tank cars comprising a pair of members Z-shaped in general cross section and so formed as to provide tank receiving areas, said members being oppositely arranged to provide inwardly extending attaching flanges, and a rigid member extending between and connecting said members.

In witness whereof I have hereunto set my hand.

VICTOR WILLOUGHBY.