Sept. 6, 1932. F. A. ISAACSON 1,875,609

RAILWAY TANK CAR

Filed Feb. 9, 1931 3 Sheets-Sheet 1

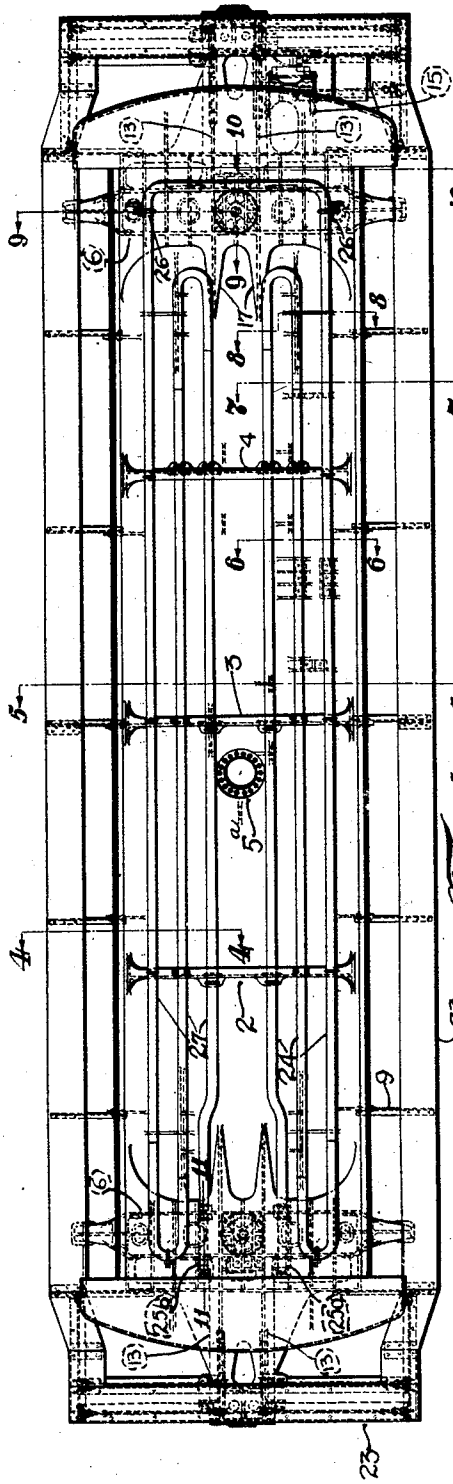


Fig. 1.

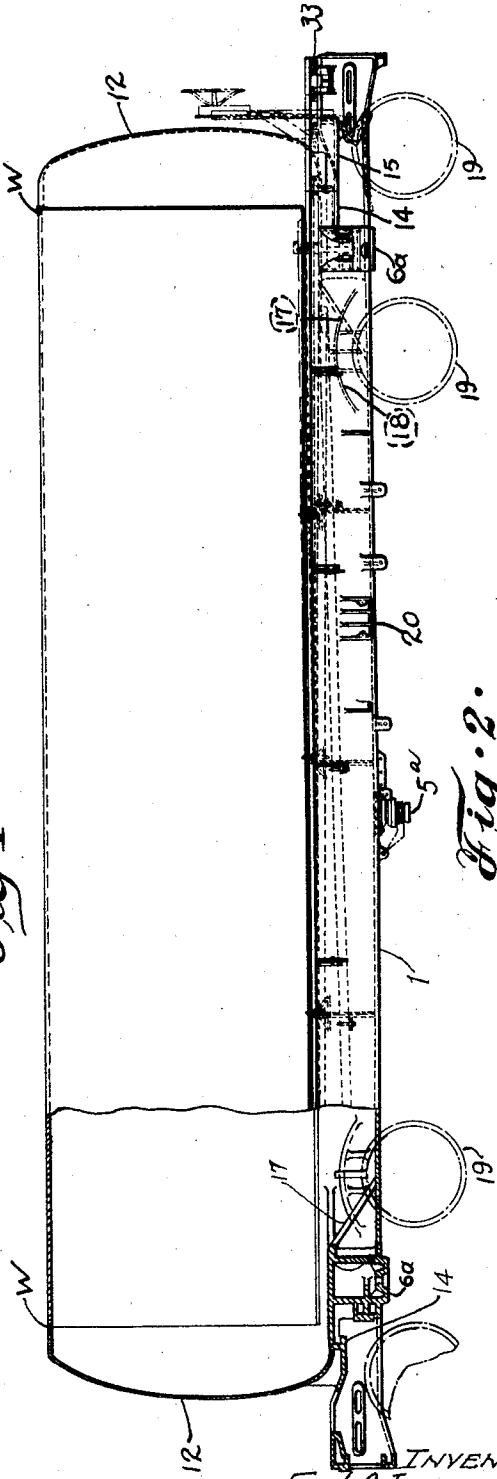


Fig. 2.

INVENTOR
Fred A. Isaacson
BY Rodney Dadell
ATTORNEY

Sept. 6, 1932. F. A. ISAACSON 1,875,609

RAILWAY TANK CAR

Filed Feb. 9, 1931 3 Sheets-Sheet 2

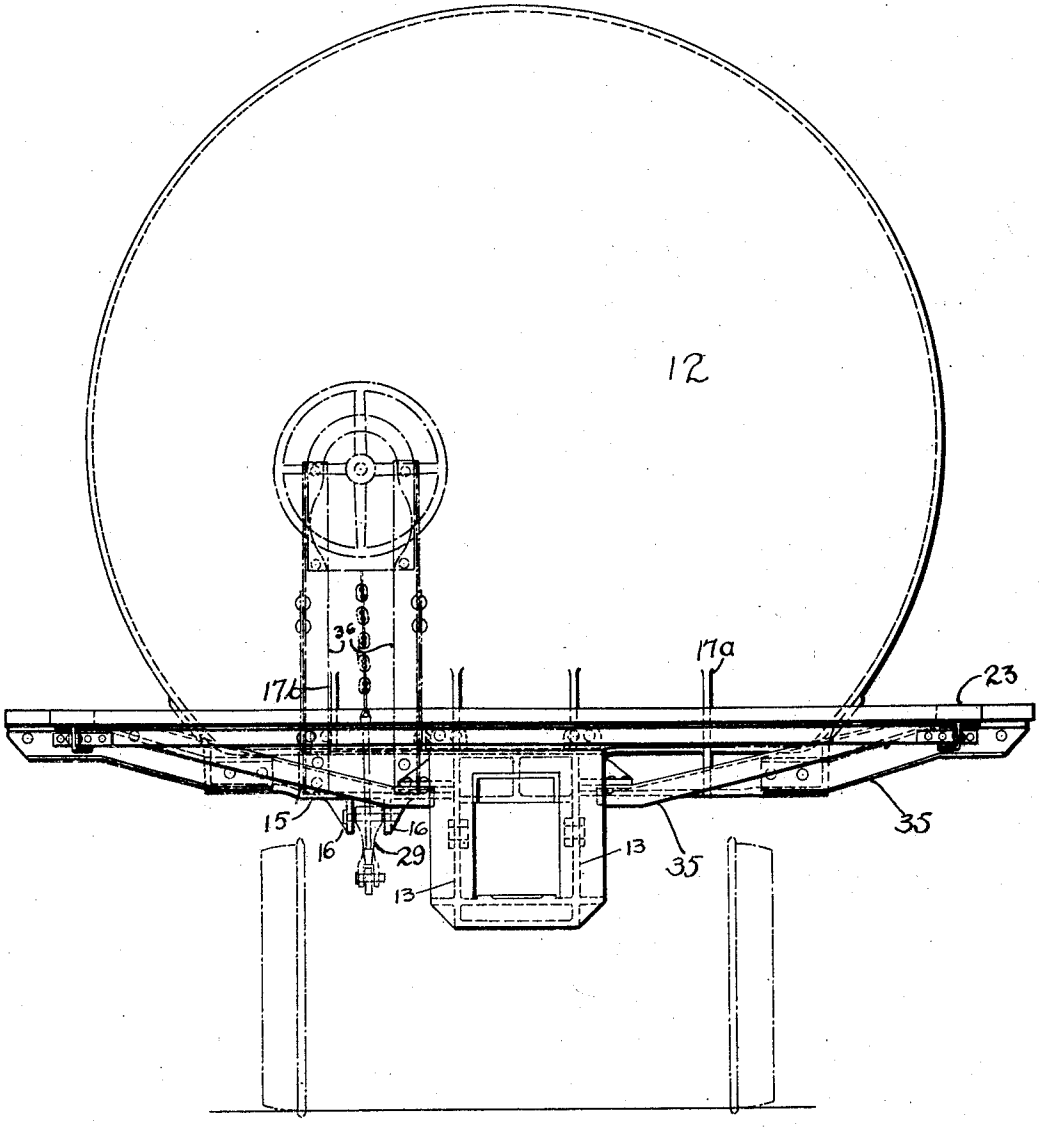


Fig. 3.

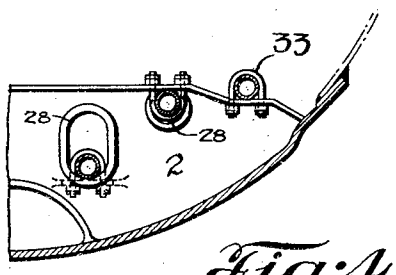


Fig. 4.

INVENTOR
Fred A. Isaacson
BY Rodney Redell
ATTORNEY

Sept. 6, 1932. F. A. ISAACSON 1,875,609

RAILWAY TANK CAR

Filed Feb. 9, 1931 3 Sheets-Sheet 3

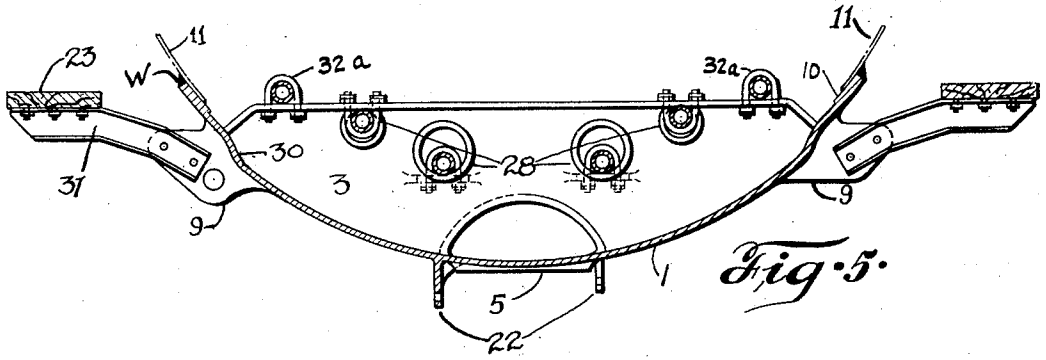


Fig. 5.

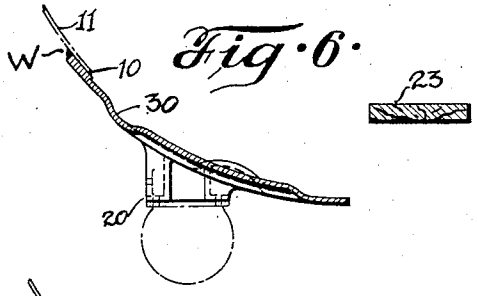


Fig. 6.

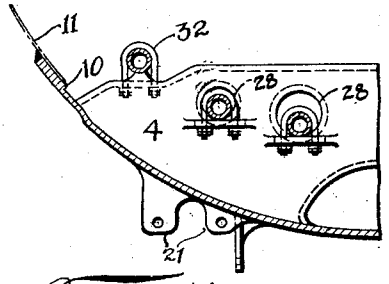


Fig. 7.

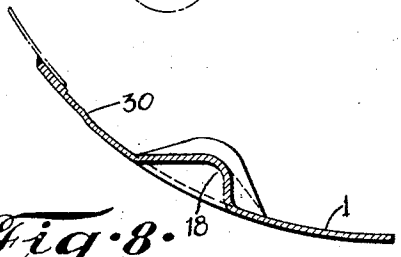


Fig. 8.

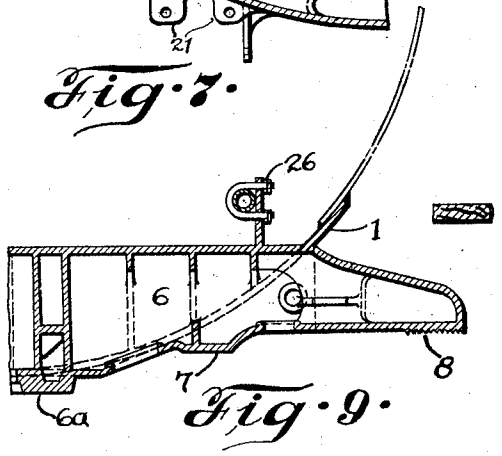


Fig. 9.

Fig. 10.

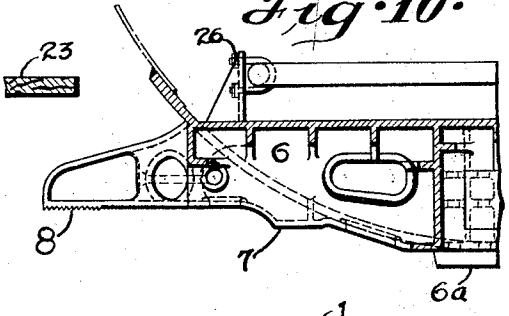




Fig. 12.

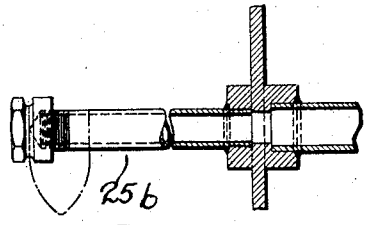


Fig. 11.

INVENTOR
Fred A. Isaacson
BY Rodney Redell
ATTORNEY

Patented Sept. 6, 1932 1,875,609

UNITED STATES PATENT OFFICE

FRED A. ISAACSON, OF CHICAGO, ILLINOIS

RAILWAY TANK CAR

Application filed February 9, 1931. Serial No. 514,351.

My invention relates to railway rolling stock and consists in a novel underframe and tank end construction for tank cars, locomotive tenders, or similar vehicles.

In the co-pending application of E. G. Hallquist, Serial No. 490,526, a tank car underframe construction is disclosed in which a broad arcuate web forming the main longitudinal member of the underframe also forms the lower quadrant of the tank, the upper portion of the tank being comprised of plates secured to the underframe web. No longitudinal sills are provided, as the combination underframe and tank bottom is rigid enough to support the vertical loads and withstand pulling and buffing stresses received by center and side sills in ordinary types of construction. The web is shown as formed integrally with bolsters, draft sills, and various brackets.

The main object of the present invention is to simplify and strengthen tank car structure by forming the tank ends integrally with the underframe. Another object is to provide a tank with an arcuate bottom which is of constant radius notwithstanding the fact that it slopes so as to drain properly. I also desire to provide suitable supports for heater pipes within the tank for heating material being transported to permit it to be drawn off through the outlet valve more readily.

These and other detail objects which will appear in the following description are attained in the structure illustrated in the accompanying drawings in which—

Figure 1 is a top view of the underframe and tank ends embodying my invention and also shows the piping arrangement.

Figure 2 is in part a side view of the same structure and in part a vertical section on the longitudinal center line.

Figure 3 is an end view of the same.

Figures 4, 5, 6, 7, 8, 9, and 10 are vertical transverse sections taken substantially on the corresponding section lines of Figure 1.

Figure 11 is a vertical longitudinal section through an inlet or outlet connection to the heater pipes.

Figure 12 is a transverse section through a portion of the web showing corrugations therein.

The underframe comprises chiefly bolsters 6, draft sills 13 and an arcuate web bottom member 1 extending between the bolsters and reinforced by internal webs or ribs 2, 3, and 4 perforated to permit the passage of heater pipes and to permit the flow of liquid from th ends of the tank to the center outlet valve 5*a* mounted in a centrally located flat boss 5. At each end, the arcuate web merges with the inner walls of the bolsters 6 which are of box section and rest upon the trucks (not shown) through the usual center plates 6*a*. The bolsters project outwardly from the tank bottom member and are provided with side bearing plates 7 and jacking pads 8 (Figure 9).

For the purpose of decreasing the time and expense required for patterns in forming a cast underframe, the curved portions of the web are formed with the same radius throughout their length. In order to provide a satisfactory support for the superstructure plates, the side portions of the web are described about a horizontal axis coinciding with the axis of the cylindrical tank and are provided with pads 10 for mounting the superstructure 11. In order to provide drainage from the ends of the web to the outlet valve 5, the intermediate portions of the web are described about axes which are inclined from the horizontal, sloping downwardly from the bolsters to the middle of the underframe. This construction results in the formation of a shoulder 30, of varying depth connecting the web sides and intermediate portions.

Ribs 2, 3, and 4 extend transversely of the web and reinforce the shoulder portions thereof and these portions are further reinforced by integral ribs 9 projecting outwardly from the web and serving as supports for the brackets 31 for the running boards 23.

Tank and members 12 of dome shape are formed integrally with the underframe and extend upwardly therefrom at points spaced outwardly from the bolsters. The tank sheets 11 abut these members and the joint

is made tight by welding or other suitable means as at W.

A transom member 14 parallels the outside wall of each bolster and the top plates of the bolsters and these transoms are imperforate and form portions of the bottom of the tank. Draft sills 13 project outwardly from these transom members and a box shaped member 15 adjacent to one draft sill at one end of the underframe is adapted to mount hand brake supports 36. Brackets 16 depend from the outer end member 15 and a hand brake bell crank 29 is pivoted between them.

The vertical webs of the draft sills 13 extend in the form of ribs through the bolster and into the concave portion of the underframe where they merge with the tank bottom, as in 17 (Figures 1 and 2). These ribs 17 serve to transmit pulling and buffing forces to the arcuate web 1. Other ribs 17*a* and 17*b* reinforce the upright end members 12.

Depressions 18 are formed in the web 1 to provide for the wheels 19.

Various brackets may be formed integrally with the underframe where needed and I show brake cylinder bracket 20, brake pull rod supports 21, and brake lever support lugs 22 as depending below the arcuate web. A running board 23 extends around the tank and rests upon brackets 9 extending outwardly from the sides of the underframe and framework of metallic straps 35 of suitable size and shape are secured to each end of the structure and support the running board at the ends of the car.

The web 1 is preferably corrugated, as shown in Figures 6 and 12, to provide for contraction of the metal when cooling, although the shape of the web itself is such as to permit considerable contraction and expansion without unduly straining the casting.

The heating piping enters the tank through nozzles 25*a* and 25*b*, and loops from end to end within the tank, as shown in Figure 1. The pipe 24 is inclined and extends back and forth and upwardly along one side of the car, reaching its highest point at bracket 26 projecting upwardly from one end of the bolster opposite the starting nozzle. It then extends in a substantially horizontal line to the other end of the bolster and then returns to the outlet nozzles in downwardly inclined loops 27. The pipe passes through openings 28 in the transverse ribs 2, 3, and 4 and the higher branches of the loops are supported on top of these ribs, as at 32, 32*a*, and 33 (Figures 5 and 7) or on brackets 26, (Figure 9).

Obviously, the structure described may be varied as to many of its details without departing from the spirit of the invention, and I contemplate the exclusive use of all such modifications or variations as come within the scope of my claims.

I claim:

1. In a railway vehicle underframe, a bolster, a tank end member integral with said bolster, and a hand brake support bracket integral with said bolster and member.

2. In a railway vehicle underframe, spaced bolsters and an arcuate web of constant radius extending between said bolsters and adapted to form a tank bottom, the intermediate portion of said web sloping downwardly towards an outlet opening.

3. In a railway vehicle underframe, spaced bolsters and an arcuate web of constant radius extending between said bolsters, the intermediate portions of said web sloping downwardly towards an outlet opening and the side portions of said web being horizontal and arranged to mount superstructure plates.

4. In a railway vehicle underframe, an arcuate web adapted to form the bottom of a tank, said web having an outer portion of constant radii taken on centers along a substantially horizontal axis, and having an inner portion of constant radii taken on centers at varying vertical distances from said axis.

5. In a railway vehicle, an underframe, a tank superstructure, and an arcuate web forming a tank bottom and also the main longitudinal member of the underframe, said web having an outer portion mounting said superstructure, the joint between said outer portion and the tank superstructure being substantially horizontal, and said web having an inner portion sloping toward an outlet opening.

6. In a railway vehicle underframe, an arcuate web adapted to form a tank bottom and running board bracket supports integral therewith in the form of ribs extending transversely of said web and reinforcing the same.

7. In a railway vehicle underframe, an arcuate web adapted to form a tank bottom and having a longitudinally extending offset portion, and running board bracket supports integral with said web and bracing said offset portion.

8. In a railway vehicle underframe, an arcuate web adapted to form a tank bottom and having a longitudinally extending offset portion, and transverse ribs extending across and reinforcing said offset portion.

9. In a railway vehicle underframe, an arcuate web adapted to form a tank bottom and having an upper portion for mounting superstructure plates and a lower portion of constant radius forming a sloping bottom for said web, there being an offset between said portions, and running board bracket supports integral with said web and bracing said offset.

10. In a railway vehicle underframe, an

arcuate web adapted to form a tank bottom and integral ribs on the concave side thereof having perforations therein at varying distances above said web, and flanges adjacent said perforations for supporting heating pipes extending therethrough.

11. In a railway vehicle underframe, an arcuate web adapted to form a tank bottom, and means integral with said web forming heating pipe supports located at varying distances above said web.

12. In a railway vehicle underframe, spaced bolsters, a main longitudinal member adapted to form a tank bottom, and transverse ribs extending across the concave part of said member, said ribs bracing said member, and means on said ribs for supporting heating pipes extending along said underframe and at varying distances above said member.

13. In a railway vehicle underframe, an arcuate web adapted to form a tank bottom, upright ribs on the concave side of said web, and brackets above said ribs adapted to support heating pipes above said web.

14. In a railway vehicle underframe, a bolster, and a tank end member of spherical contour above said bolster with its lower portion extending horizontally and merging with said bolster.

15. In a railway vehicle underframe, bolsters, and an arcuate web forming the main longitudinal member between said bolsters and sloping throughout its length, there being a flat boss on the lower face of said web at its lower most point for mounting an outlet valve.

16. A railway vehicle underframe including a web having an arcuate transverse cross section, said web sloping downwardly in a longitudinal direction towards an outlet opening.

17. In a railway vehicle underframe, an arcuate web adapted to form a tank bottom and transverse ribs on the concave side thereof having perforations for supporting piping extending along said underframe.

In testimony whereof I hereunto affix my signature this fourth day of February, 1931.

FRED A. ISAACSON.