March 20, 1928. 1,663,036

W. O. ASHE ET AL

RAILWAY VEHICLE STRUCTURE

Filed July 1, 1927 3 Sheets-Sheet 1

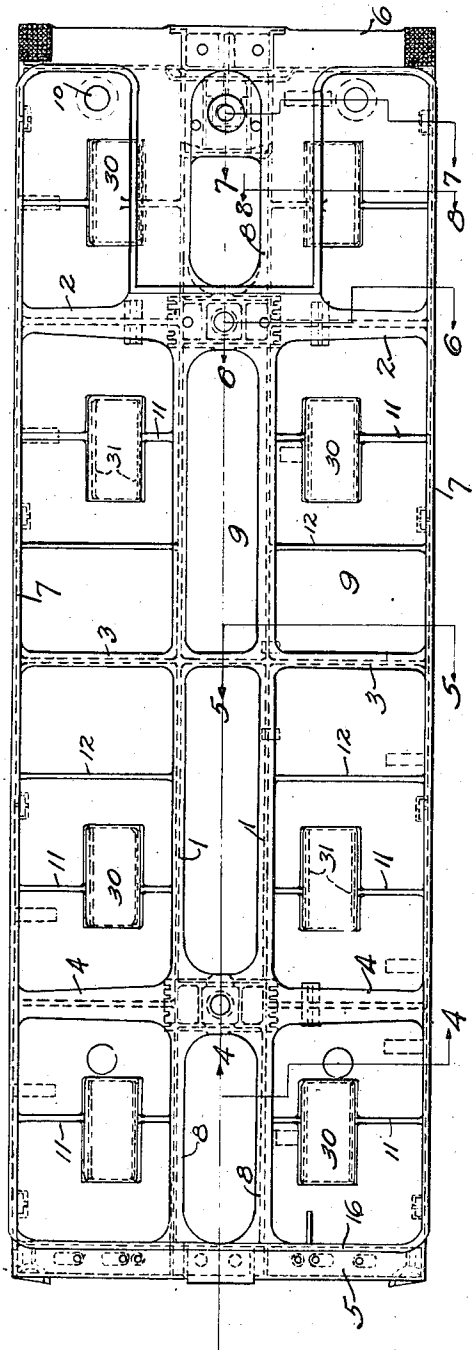

FIG. 1.

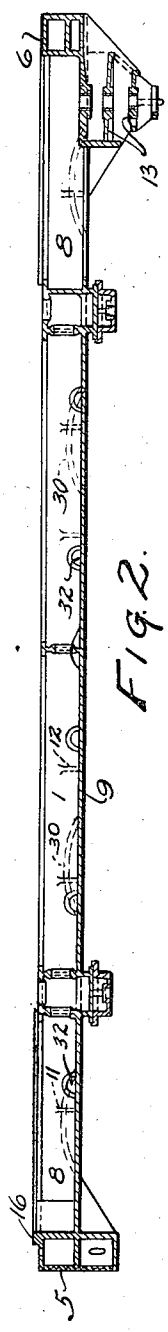

FIG. 2.

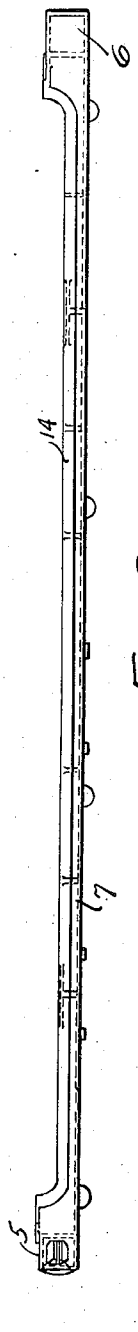

FIG. 3.

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Filed July 1, 1927 3 Sheets-Sheet 2

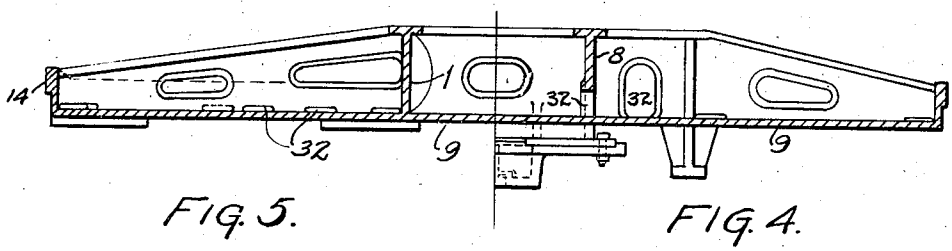

FIG. 5. FIG. 4.

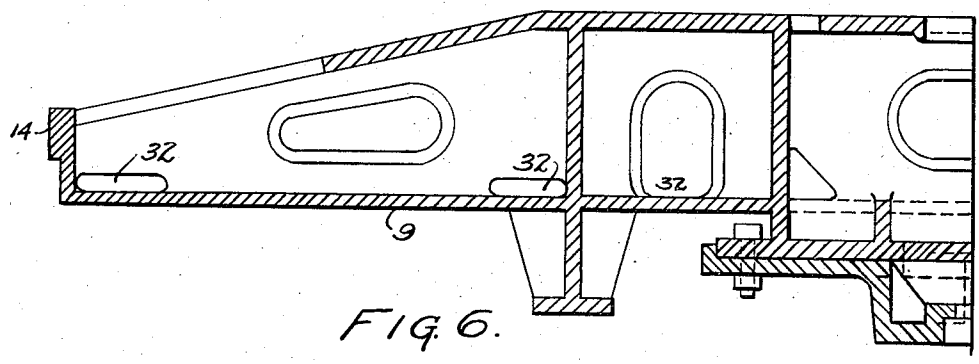

FIG. 6.

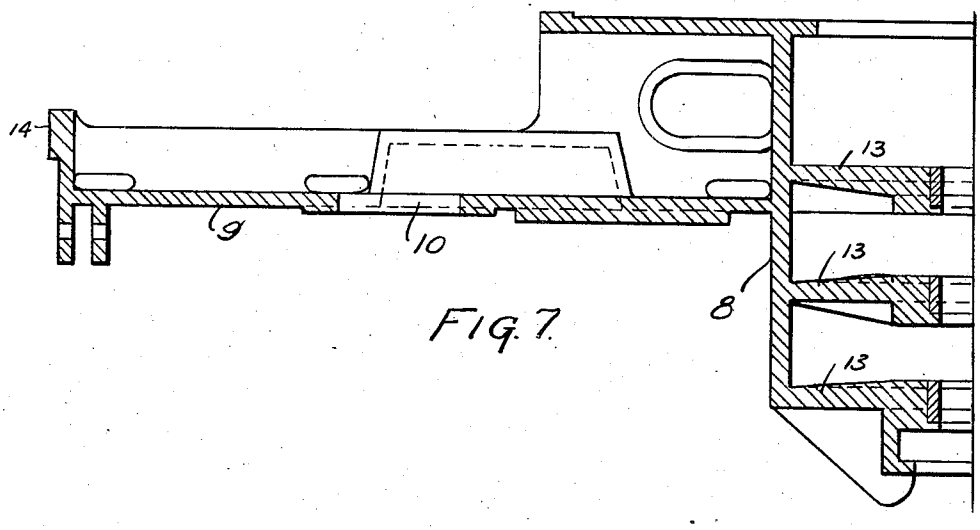

FIG. 7.

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Filed July 1, 1927

3 Sheets-Sheet 3

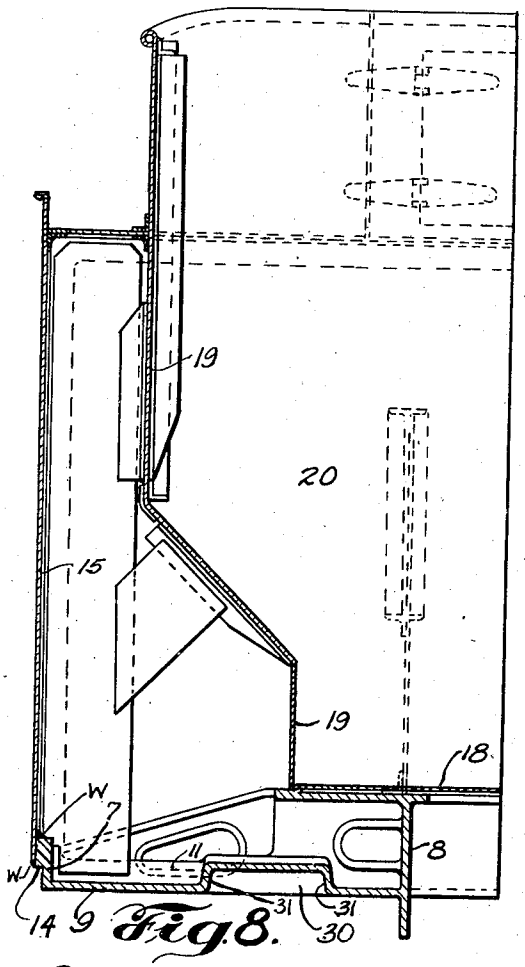


Fig. 8.

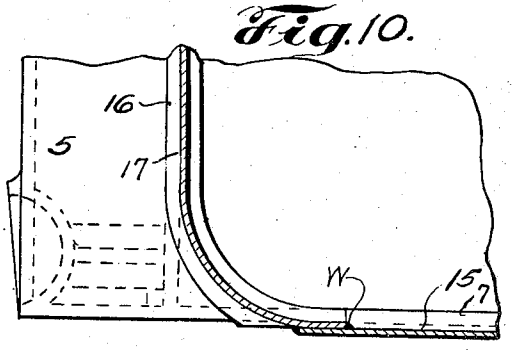


Fig. 10.

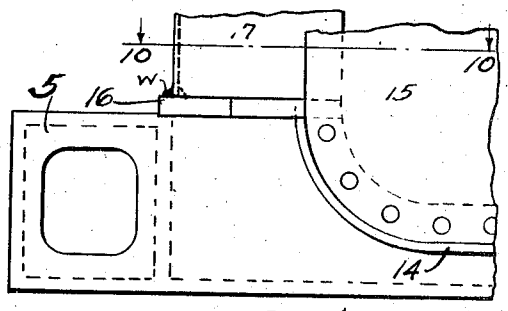
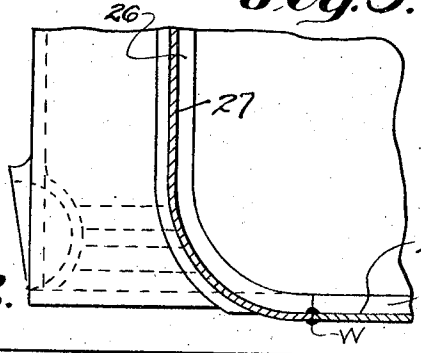


Fig. 9.



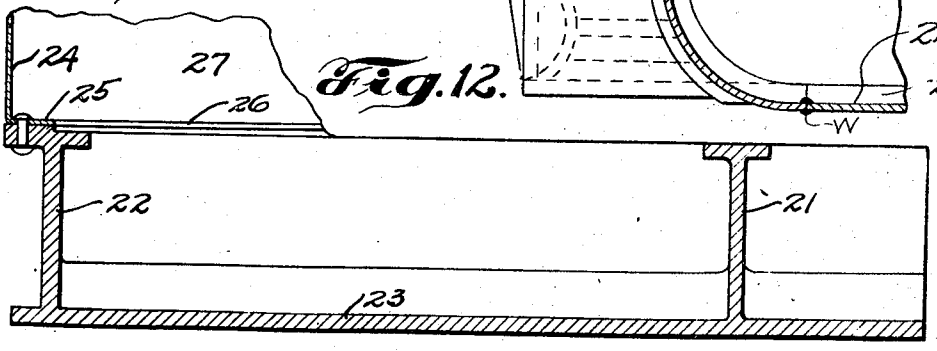


Fig. 12.

Fig. 11.

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UNITED STATES PATENT OFFICE.

WILLIAM O. ASHE AND HARRY M. PFLAGER, OF ST. LOUIS, MISSOURI, ASSIGNORS TO COMMONWEALTH STEEL COMPANY, OF GRANITE CITY, ILLINOIS, A CORPORATION OF NEW JERSEY.

RAILWAY VEHICLE STRUCTURE.

Application filed July 1, 1927. Serial No. 202,877.

Our invention relates to railway rolling stock and consists in an improved construction of underframing and superstructure for railway vehicles intended primarily to carry liquid and our invention is particularly adapted for use in locomotive tender construction.

One object of our invention is to provide an improved underframe casting which in itself may form the bottom of a tank structure and upon which the sides and ends of the tank may be mounted thereby lightening the weight of the whole vehicle.

Another object of our invention is to utilize the heavy tank-forming plates of the superstructure as load transmitting girders supplementing the underframe sills, thereby making it possible to lighten the latter.

Another object of our invention is to provide an improved connection between the side and end sheets of the superstructure and between the same and the underframe.

Another object of our invention is to lower the center of gravity of the vehicle, particularly when it is loaded.

These and various other detail objects are attained in the structure illustrated in the accompanying drawings in which

Figure 1 is a longitudinal top view of our improved underframe casting.

Figure 2 is a longitudinal vertical section taken on the center line of the casting.

Figure 3 is a side elevation of the casting.

Figures 4, 5, 6, and 7 are vertical transverse sections taken on lines 4—4, 5—5, 6—6, and 7—7 of Figure 1.

Figure 8 is a vertical transverse section taken on line 8—8 of figure 1 and showing the superstructure applied to the underframe.

Figure 9 is a detail side elevation of one corner of the tank and underframe structure.

Figure 10 is a transverse horizontal section taken on line 10—10 of Figure 9.

Figure 11 is a vertical transverse section illustrating a modified form of our invention.

Figure 12 is a horizontal section corresponding to Figure 10 but illustrates a modification in the connection between the side and end plates of the tank structure.

The underframe of our improved vehicle structure is preferably formed of a one-piece casting comprising spaced center sills 1 of substantial depth and suitably flanged for reinforcement, transom members 2, 3, and 4, end sills 5 and 6, and side sills 7. At the transoms 2 and 4, which form the bolsters, center sills 1 merge with the draft sills 8 which extend between the bolsters and end sills.

A horizontally disposed web 9 extends between the side sills and draft sills and transoms and end sills and also between the center sills and is substantially imperforate throughout its area, being provided, however, with suitable openings 10 for connection to pipes leading to the engine. Web 9 is also provided with upwardly extending depressions 30 which are arched longitudinally of the underframe and serve to accommodate the truck wheels. The vertical side wall 31 of these recesses are braced by ribs 11 and the flat area of web 9 is also braced by suitable ribs 12.

Between the front draft sills 8, the underframe is open upwardly and downwardly, the inner end of this space being closed by the adjacent bolster and the outer end of this space being closed by the corresponding end sill. Transverse members 13 are formed integral with the front end of the forward draft sills 8 and form pockets for draw bar equipment.

Each side sill 7 is provided with a raised pad 14, which may be machined, and is adapted to have the superstructure side plate 15 applied thereto and secured either by welding (as indicated at W), or riveted directly to the underframe or to a connecting angle iron.

The rear end sill 5 has a pad 16 on its upper face (see Figures 1, 9, and 10) the end porton of the pad being rounded and cut away so that its outer edge does not project beyond the outer face of the pad 14 on the side sill.

The tank end plate 17 rests upon and is welded to pad 16 of the end sill. The end plate 17 is curved as shown and overlapped and welded or otherwise secured to side plate 15.

Spaced from the side plates 15 in the front portion of the tender are suitable partition plates 19 and an inclined floor plate 20 and it will be understood that these plates form a coal compartment in the forward center

part of the tender. A suitable shovel plate 18 may be utilized to cover the opening between the draft sills.

The side plates are of substantial thickness and form an extension of the load carrying side sills 7 serving to resist both vertical and longitudinal forces and as a result, the underframe structure may be lightened accordingly. The forming of the bottom of the tank by the one-piece underframe described eliminates the material and labor required for assembling tank bottom plates with an underframe and also provides a low center of gravity for the vehicle body structure especially when loaded, as a substantial part of the water or other liquid is carried below the top of the underframe.

It will be noted that suitable openings 32 are provided in the transoms and center sills to permit free passage of liquid from one end of the tank to the other.

In the modification illustrated in Figures 11 and 12, the underframe includes a center sill 21, a flanged side sill 22 and an integral horizontal web 23. The superstructure side plate 24 is connected to the underframe by means of an inturned flange 25 which may be riveted, as shown, or welded to the underframe. A similar flange connection 26 may be used for the end plate 27. Like the preferred structure, this modification contemplates the use of a one-piece casting forming the bottom and the lower portion of the sides and ends of the tank.

In this modification, the end and side plates are not overlapped, a butt joint being formed by welding the edges of the plates together.

Obviously other modifications in the details of our invention may be made by those skilled in the art without departing from the spirit of our invention. We contemplate the exclusive use of such modifications as fall within the scope of our claims.

We claim:

1. A railway vehicle underframe casting comprising a complete tank bottom member.

2. A railway vehicle underframe casting comprising a complete tank bottom member and elements on said casting adapted to mount the sides and ends of a tank superstructure.

3. A railway vehicle underframe casting comprising spaced longitudinal and transverse members with vertical webs, and a horizontally disposed web between said members, said casting being adapted to form the bottom of a tank and the sides and ends of said casting having raised pads for the attachment of side and end superstructure plates.

4. A railway vehicle underframe casting comprising longitudinal sills, transverse webs and a horizontally disposed member connecting the lower portions of said sills and webs and forming therewith the bottom portion of a tank.

5. A railway vehicle underframe casting comprising longitudinal sills, transoms, bolsters, a horizontally disposed web connecting the lower portions of said sills, transoms and bolsters, and reenforcing ribs traversing said web between said transoms and bolsters.

6. In a one-piece-underframe casting, longitudinal sills, transoms, and a horizontally disposed web extending between the lower portions of said sills and transoms, said web, sills and transoms forming a water containing underframe, said web being provided with downwardly facing upwardly extending recessed portions to accommodate the wheels of a truck upon which the underframe is mounted.

7. In a one-piece underframe casting, longitudinal sills, transoms, and a horizontally disposed web extending between the lower portions of said sills and transoms, said web, sills and transoms forming a water containing underframe, said web being provided with downwardly facing upwardly extending recessed portions arched longitudinally of the underframe and adapted to accommodate the wheels of a truck upon which the underframe is mounted.

8. In a water containing, one-piece railway underframe casting, sills, transoms, a horizontally disposed web extending between the lower portion of said sills and transoms, downwardly-facing upwardly-extending recesses in said web to accommodate the wheels of a truck upon which the underframe is mounted and reenforcing ribs extending between the sides of said recesses and said sills.

9. In a water containing, one-piece railway underframe casting, center sills, draft sills, side sills, transoms, a horizontally disposed web extending between the lower portion of said center sills, side sills, and transoms and forming therewith a tank bottom, the space between said draft sills being open vertically but closed at its inner end by one of said transoms.

10. In a water containing, one-piece railway underframe casting, center sills, draft sills, side sills, transoms, a horizontally disposed web extending between the lower portion of said center sills, side sills, and transoms and forming therewith a tank bottom, the space between said draft sills being open vertically but closed at its inner end by one of said transoms, and members integral with the forward ends of said draft sills for forming a drawbar pocket.

11. In a one-piece underframe casting, shallow side sills adapted to mount plate superstructure, a horizontally disposed web extending between said sills and adapted to form the bottom of a tank structure, center sills extending upwardly from said web to

above the level of said side sills, transoms integral with said sills and web and extending downwardly and outwardly from the tops of said center sills to the tops of said side sills.

12. In a railway vehicle, a one-piece underframe, and superstructure, said underframe and superstructure cooperating to form a tank.

13. In a railway vehicle, a one-piece underframe, and superstructure, said underframe and superstructure cooperating to form a tank, a substantial portion of which tank extends below the level of the top of said underframe.

14. In a railway vehicle, an underframe casting, and superstructure mounted thereon, said casting forming the bottom of a tank and said superstructure forming the sides and ends of said tank.

15. In a railway vehicle, an underframe casting having elevated and depressed portions, superstructure mounted on said elevated portions, said superstructure and casting cooperating to form a tank.

16. In a railway vehicle, an underframe casting having elevated and depressed portions, superstructure mounted on said elevated portions, said superstructure and the depressed portions of said casting forming a tank structure extending below the bottom of said superstructure.

17. A railway tank car structure comprising a tank bottom, consisting of a one-piece car underframe, and superstructure sides secured to said underframe.

18. In a railway vehicle, an underframe casting having raised pads along its sides, and a plate superstructure extending below the top of said casting and secured to said pads, said casting and superstructure forming the bottom and sides of a tank respectively.

19. In a railway car, an underframe casting, superstructure plates secured to said casting and forming the sides of a tank, said casting having integral depressed portions extending below the lower edges of said plates and forming portions of the bottom of a tank.

20. In a railway vehicle, an underframe casting forming a tank bottom member and having side and end sills, there being raised pads on the exterior faces of said side sills and on the top face of said end sill, tank side plates secured to said side sill pads and extending upwardly therefrom, and a tank end plate secured at its lower end to said end sill pads, said side and end plates overlapping and being secured to each other above said underframe.

21. In a railway vehicle, an underframe casting forming a tank bottom member and having side and end sills, there being raised pads on the exterior faces of said side sills and on the top face of said end sill, the pad on said end sill having arcuate end portions merging with the pads on said side sills, tank side plates secured to said side sill pads and extending upwardly therefrom, and a tank end plate secured at its lower end to said end sill pad, and at its sides continuing so as to overlap said side plate and be secured thereto.

In testimony whereof we hereunto affix our signatures this 28th day of June, 1927.

WILLIAM O. ASHE.
H. M. PFLAGER.