Sept. 29, 1931. H. M. PFLAGER 1,825,476

RAILWAY CAR STRUCTURE

Filed Aug. 11, 1930 5 Sheets-Sheet 1

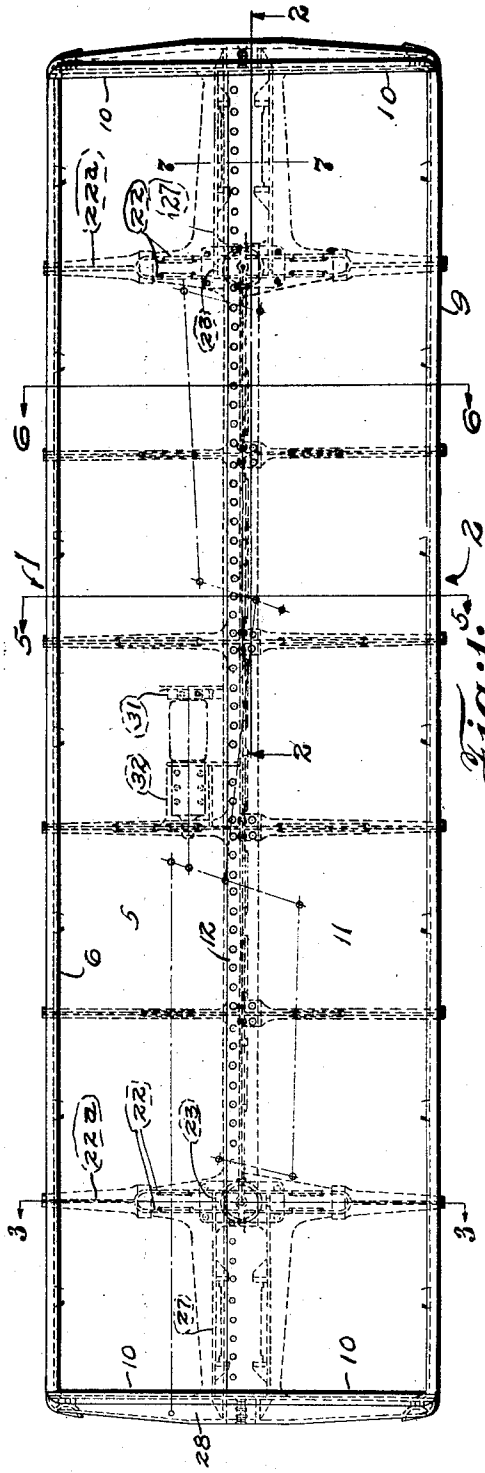


Fig. 1.

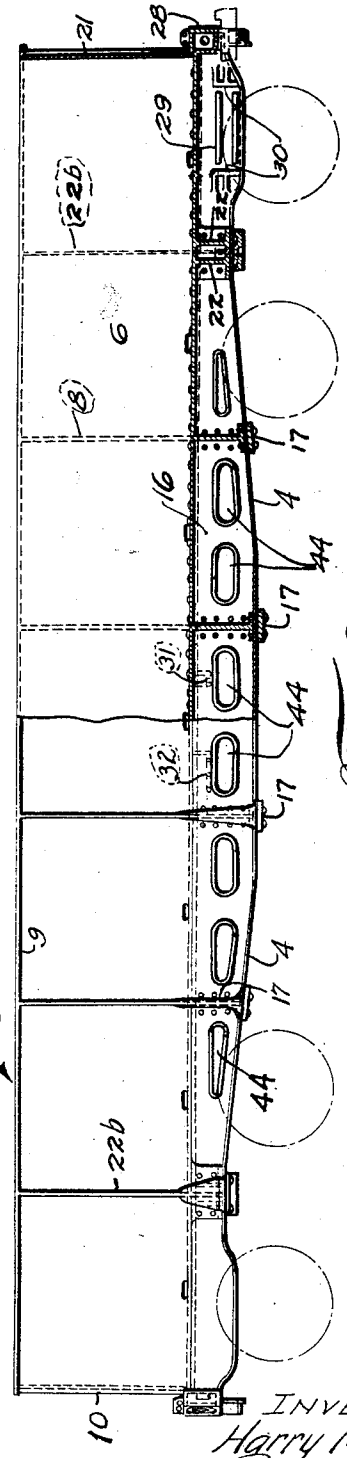


Fig. 2.

INVENTOR
Harry M. Pflager
BY Rodney Dedels
ATTORNEY

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RAILWAY CAR STRUCTURE

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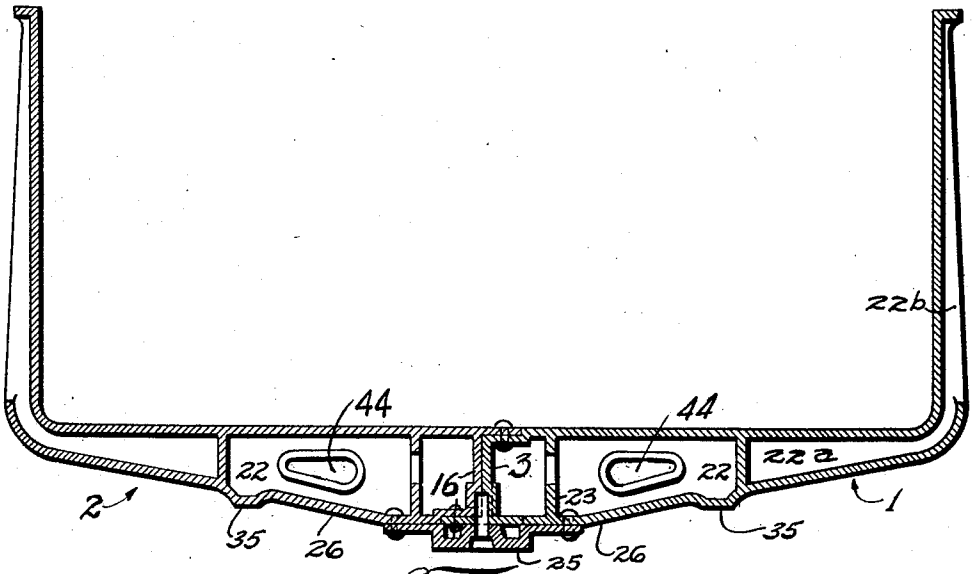


Fig. 3.

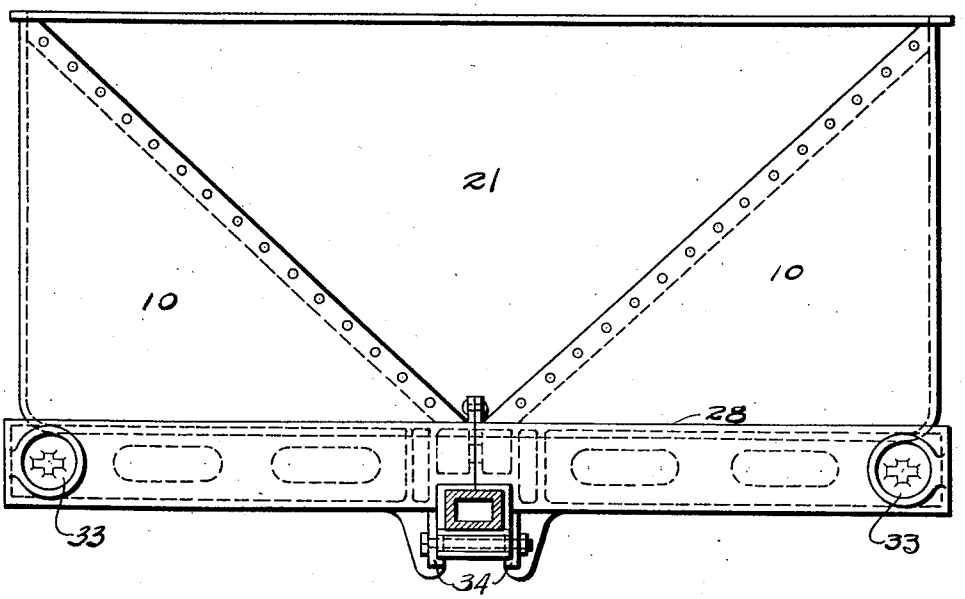


Fig. 4.

INVENTOR
Harry M. Pflager
BY Rodney Bedell
ATTORNEY

Sept. 29, 1931. H. M. PFLAGER 1,825,476

RAILWAY CAR STRUCTURE

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Fig. 6.

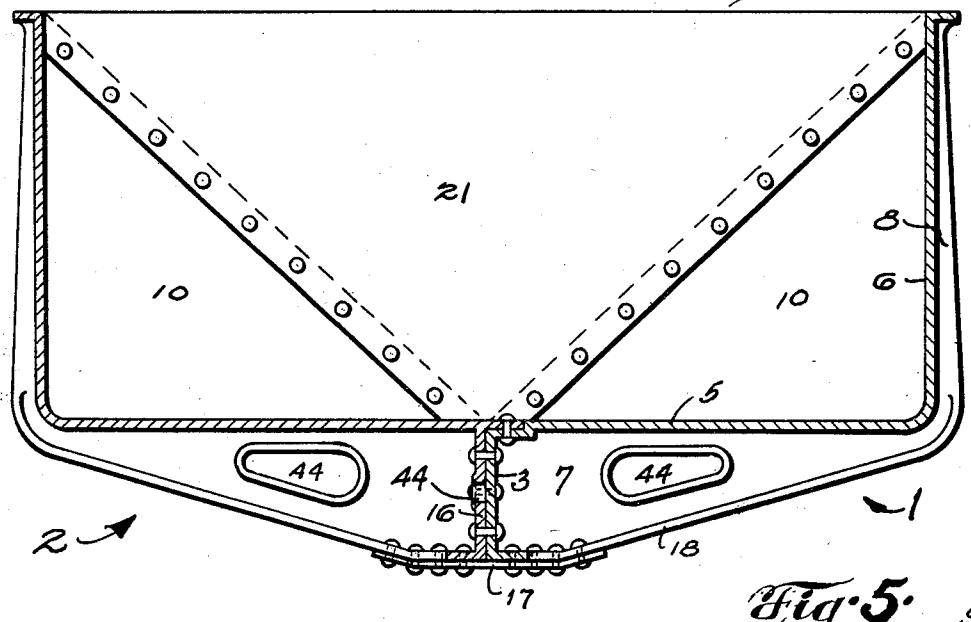
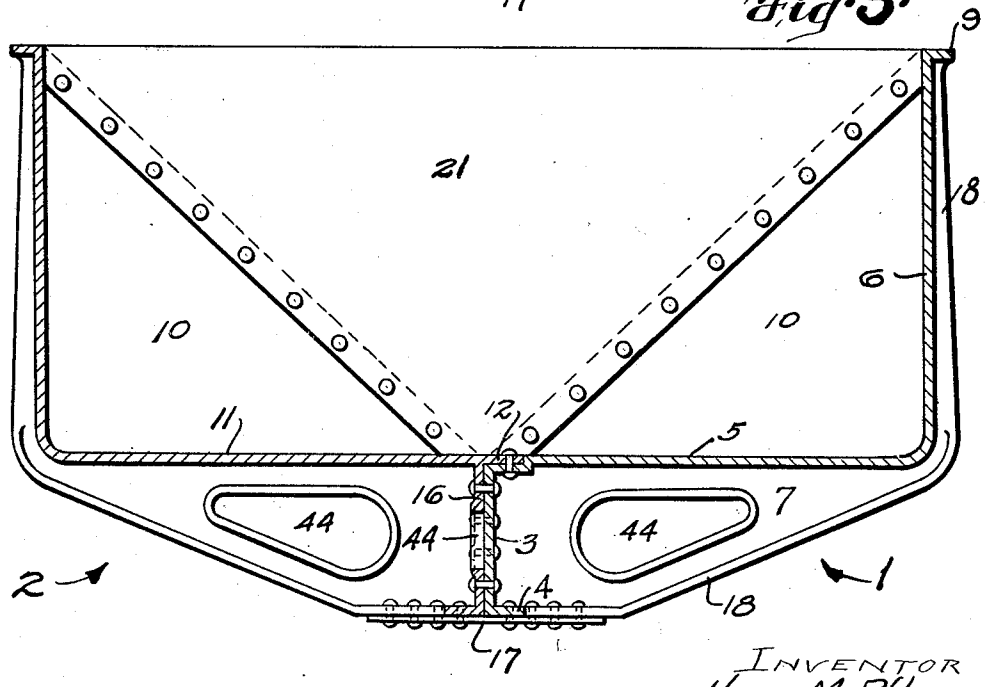


Fig. 5.



INVENTOR
Harry M. Pflager
By Rodney Bedell
ATTORNEY

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RAILWAY CAR STRUCTURE

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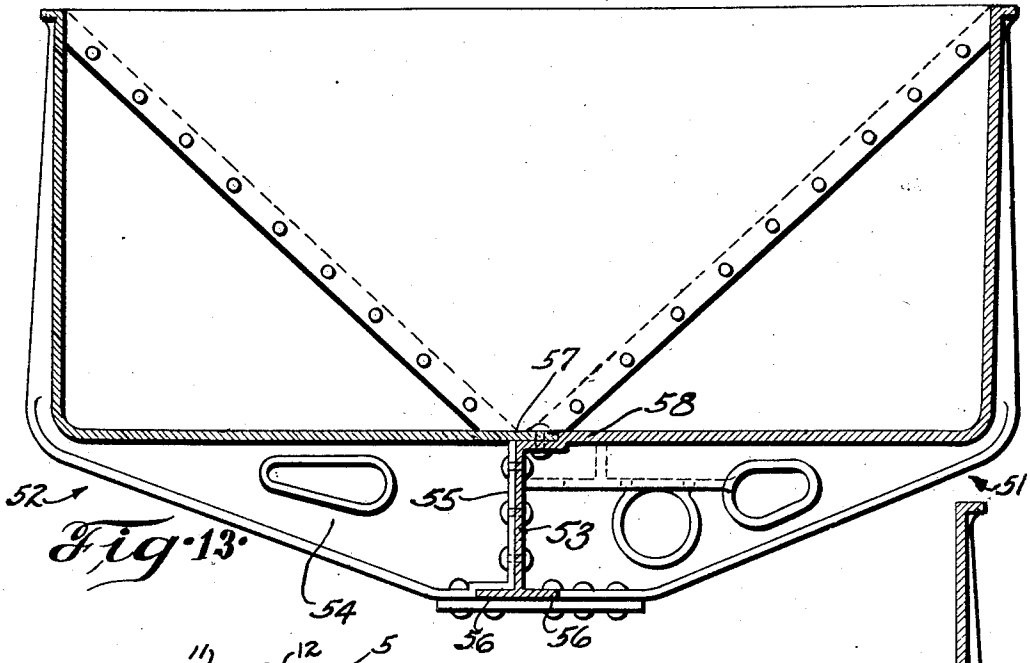


Fig. 13.

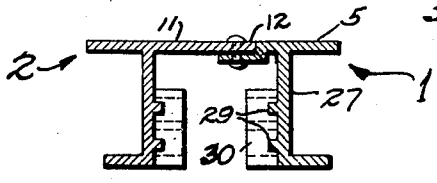


Fig. 7.

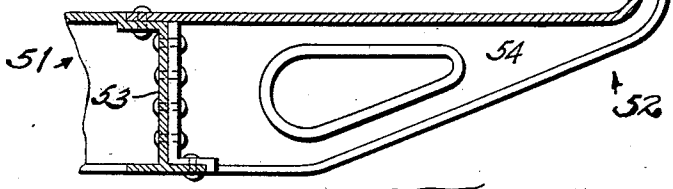
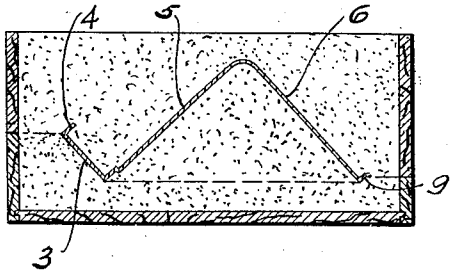


Fig. 14.

Fig. 8.



INVENTOR
Harry M. Pflager
BY Rodney Bedell
ATTORNEY

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RAILWAY CAR STRUCTURE

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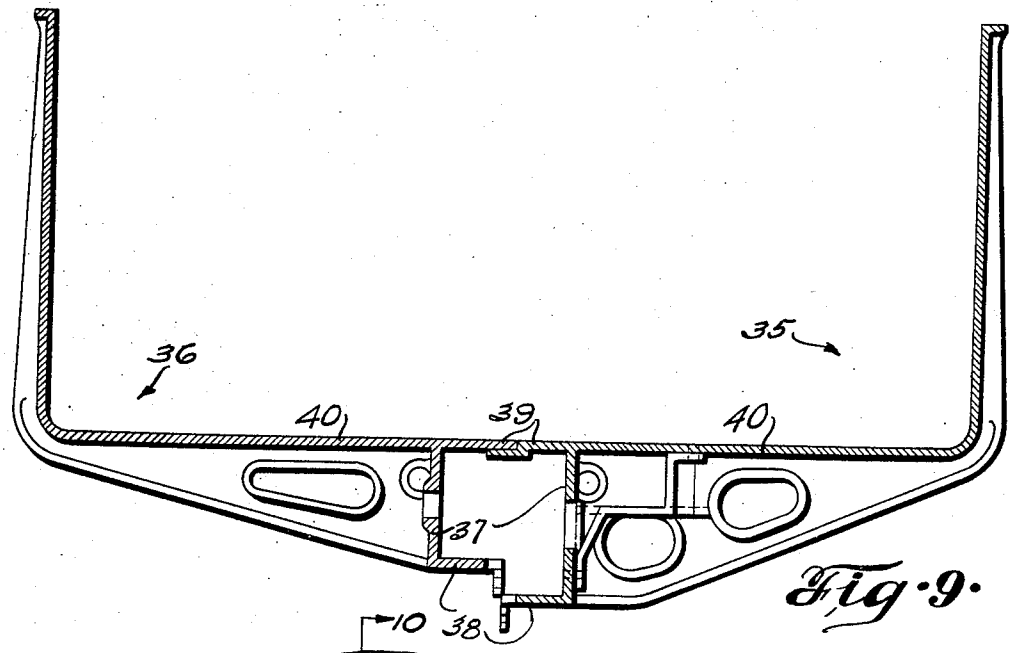


Fig. 9.

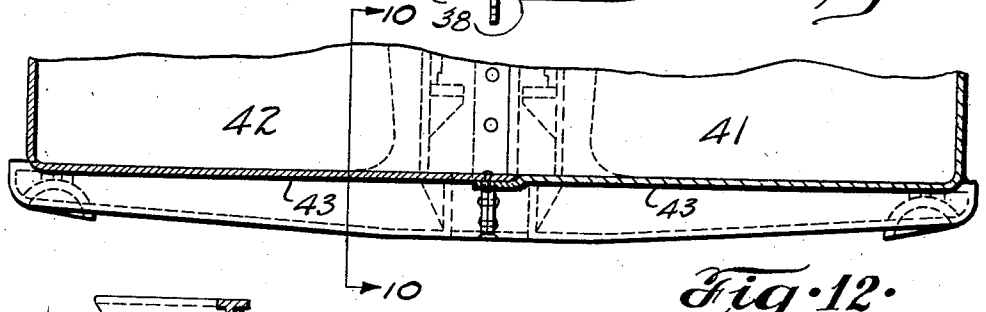


Fig. 12.

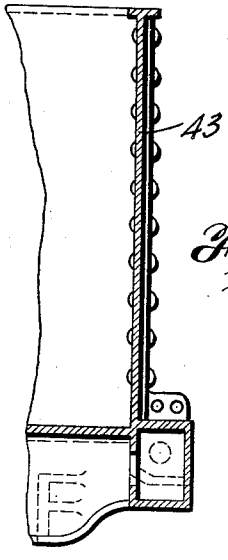


Fig. 10.

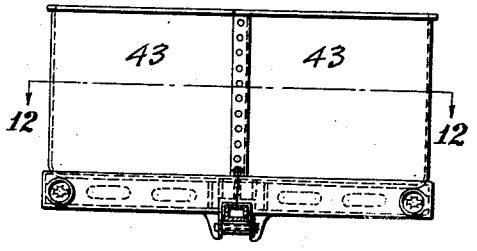


Fig. 11.

INVENTOR
Harry M. Pflager
BY Rodney Bedell
ATTORNEY

Patented Sept. 29, 1931 1,825,476

UNITED STATES PATENT OFFICE

HARRY M. PFLAGER, OF ST. LOUIS, MISSOURI, ASSIGNOR TO GENERAL STEEL CASTINGS CORPORATION, OF GRANITE CITY, ILLINOIS, A CORPORATION OF DELAWARE

RAILWAY CAR STRUCTURE

Application filed August 11, 1930. Serial No. 474,561.

My invention relates to railway rolling stock and consists in a complete car body and underframe unitary structure and the method of forming the same.

One object of my invention is to provide a light, strong car structure which may be made at a reasonable cost. I desire to form substantial portions of the car body and underframe in an integral unit and preferably the entire car body and underframe is formed substantially of two such units, each comprising a longitudinal half of the car structure. One effective way of forming this preferred structure is to utilize a one-piece casting for each unit.

Other objects attained by this structure are the elimination of joints such as formed by a plurality of overlapping plates and the necessity for maintenance repairs necessary because of such built-up structure, and also to eliminate the rapid corrosion which is present in the usual built-up construction and is greatly facilitated by the accumulation of moisture and dirt in the joints.

I desire to carry the car load through a unitary structure which will include a center sill from end to end and side walls united therewith in such manner as to contribute to carrying the load.

In my copending application, Serial No. 469,405, filed July 21, 1930, I disclose complete car body and underframe structure formed in a single casting. By making the car structure in two units as described herein, I am able to make the casting in a shallower mold than is possible where the complete car body is formed in one piece, thus reducing the cost of manufacture, and the attainment of this advantage is another object of my invention.

Other detailed objects of my invention will appear from the following description and I attain all of the objects referred to by the structure illustrated in the accompanying drawings in which—

Figure 1 is a top view of a railway car structure.

Figure 2 is in part a side elevation and in part a vertical section on the line 2—2 of Figure 1.

Figures 3, 5, 6 and 7 are vertical transverse sections taken on the corresponding section lines of Figure 1.

Figure 4 is an end elevation of the car structure.

Figure 8 is a diagrammatical and illustrates a preferred method of casting one of the units of the car structure.

Figure 9 is a vertical transverse section similar to Figure 5 illustrating a modified structure.

Figure 10 is a longitudinal vertical section through the end of a modified structure, the section being taken on the line 10—10 of Figure 12.

Figure 11 is an end view of the latter.

Figure 12 is a horizontal section taken on the line 12—12 of Figure 11.

Figures 13 and 14 are vertical transverse sections illustrating another modification of my invention.

The preferred structure embodies two major units which I designate 1 and 2, respectively. Referring to Figure 5, it will be seen that the right hand unit comprises a floor portion, side wall portion, and a center sill portion, all extending longitudinally of the car from end to end and formed by a one-piece casting.

The center sill portion comprises a vertical web 3 with a horizontal flange 4 along its lower edge. The car floor portion 5 contributes a top flange to the center sill. The car side wall portion 6 extends upwardly from the outer edge of the floor and a plurality of transverse transoms have vertical webs 7 extending from the center sill web 3 outwardly along the floor 5 and have integral continuations 8 extending upwardly along the car side in stake form. A flange 18 along the lower edge of web 7 merges with adjacent center sill flange 4. The outer end of flange 18 terminates just above the level of the floor. The elements 7, 8 and 18 and the adjacent portion of the floor 5 and wall 6 form a transom or cross bearer of I beam section merging with a vertical stake of T section serving to reinforce the structure intermediate its ends. A reinforcing flange 9

extends along the upper edge of the car side wall.

Each end of the unit 1 includes spaced bolster walls 22 extending outwardly from the web 3 and merging with a single bolster web 22*a* having an upward extension 22*b* along the car side wall. Transverse bolster webs 23 cooperate with central vertical web 3 to distribute the vertical load to the center plates 25 applied to the lower webs 26 of the bolster members.

A draft sill 27 at each end of unit 1 extends from the box-like end sill 28 to the bolster and is alined with webs 23 to better distribute the longitudinal forces. Preferably the draft sills include integral elements 29 for spacing the draft rigging and also include elements 30 forming stops for the draft lugs.

Brackets 31 and 32 are formed integrally with the floor and center sill portions of unit 1 and serve to mount the air brake cylinder and reservoir.

The other major unit 2 is substantially like unit 1 but its floor 11 includes a portion 12 extending beyond its center sill web portion 16 and overlapping the depressed portion of the floor of unit 1 and cooperating with the remainder of the floor portion of unit 1 to maintain a flat floor surface.

Each of the units includes an end wall element 10 preferably formed integral with the side wall and floor in the shape of a triangular web extending from the juncture of the floor and side wall to an inclined line connecting the top of the side wall and the inner portion of the floor. The end of the car is completed by a triangular plate 21 formed separately from either unit and secured to elements 10.

Ties or gussets 17 extend across the lower portions of the transoms and prevent separation of the units which might otherwise result from concentrating the car load along the center of the floor.

The two units are riveted to each other, through the overlapping floor elements, throughout the length of the car and also through their abutting sill elements 3 and 16. The riveting together of the end wall elements constitutes an additional tie.

By referring to Figure 8, it will be seen that the major unit 1 may be cast in a mold of substantially less depth than the vertical distance from the top of the car side wall to the bottom of the center sill. This fact, and the casting of a single half of the car at one time, makes it possible to use a much smaller mold than would be required if the entire car body and underframe were cast in one piece and, also, the casting should be of more uniform density because of the reduction in the head of molten metal existing when the casting is poured.

By forming the side wall, floor, and center sill elements as described, the side wall contributes materially to the carrying of the car load and it is possible to eliminate the usual side sills below the floor, thus providing a structure of minimum weight and also increasing clearance below the car floor. The castings are further lightened by the free use of suitable openings 44 in various webs. Numerous other elements of the complete car may be formed integrally with the major units and I refer specifically to the push pole pockets 33, the coupler carrier brackets 34, and the side bearing mounting pads 35.

In the modified structure illustrated in Figure 9, I show my invention as embodying a box-shaped center sill. In this structure, each unit 35 and 36, respectively, will have an individual depending center sill web 37 provided with a bottom flange 38. These bottom flanges 38 and the inner portions 39 of the floors 40 are secured together by bolting, riveting, or welding to form a box girder extending from bolster to bolster.

Figures 10, 11 and 12 illustrate modified end structure in which the entire end is formed by integral portions of the two units 41 and 42. Each of the end elements 43 is of rectangular shape and their contiguous edges overlap and are riveted together.

Figures 13 and 14 illustrate another modification in which the right hand unit 51 is provided with a center sill web 53 and the left hand unit 52 has no such sill web but its transom webs 54 terminate in vertical flanges 55 which may be secured to web 53. Web 53 has lower flanges 56 and with the adjacent floor elements 57 and 58 completes a desirable I-beam section center sill directly supporting the left hand unit 52. Otherwise the units are substantially like those shown in Figures 1 to 8.

While I have shown the car body and underframe structure formed of two major units, each consisting of a single casting, it is within the spirit of my invention to form each of these units extending only a half or less of the length of the car and to unite the same similarly to the manner in which the illustrated units are united. Similarly, the end wall elements, or a part or all of one or more transom or bolster elements, could be formed separately and united with the corresponding major unit and still embody the broader features of my invention. I refer particularly to the formation of an integral unit, comprising a car body side wall element and a floor element, adapted to be secured to a complementary unit to form a complete cross section of a car underframe and body with side walls.

While I have shown the two units riveted to each other and further secured by ties riveted to the two units, I also contemplate securing the units together by means of welded or bolted joints and I contemplate the ex-

clusive use of various other modifications of my invention coming within the scope of my claims and including the spirit of my invention as expressed in my claims.

I claim:

1. A railway car structure comprising a longitudinal half section of a car floor and a center sill integral with said floor.

2. A railway car structure comprising a longitudinal half section of a car floor and a center sill integral with said floor and provided with elements for engaging and supporting a complementary car floor unit.

3. A railway car structure comprising a longitudinal half section of a car floor and a center sill integral with said floor and depending therefrom, and a transverse reinforcing member extending from the lower part of said sill outwardly and upwardly to said floor.

4. A railway car structure comprising a longitudinal half section of a car floor and a center sill integral with said floor and depending therefrom, and a transverse reinforcing member extending from the lower part of said sill outwardly and upwardly to said floor, said structure being provided with elements for engaging and supporting a complementary car floor and transom unit.

5. A unitary structure comprising a car side wall portion and approximately half of a car floor portion.

6. A unitary structure comprising a car side wall portion, approximately half of a car floor portion, and a car center sill portion below said floor portion.

7. A unitary structure comprising a car side wall portion, approximately half of a car floor portion, and a reinforcing member extending transversely along said wall and floor portions.

8. A unitary structure comprising a car side wall portion, approximately half of a car floor portion, a center sill portion below said floor portion, and a reinforcing member extending transversely from the lower portion of said center sill portion upwardly and outwardly along said floor and wall portions.

9. A car structure comprising a longitudinal half section of a car floor and a center sill formed integrally with said floor, there being a recess in the top of said structure for receiving a projecting floor element on a complementary structure.

10. A car structure comprising a longitudinal half section of a car floor and a center sill formed integrally with said floor, there being a flange on said center sill spaced below the top thereof for engaging and supporting a complementary structure.

11. A unitary structure comprising a car side wall portion, approximately one half of a car floor portion, and part of a car end extending between the top of said side wall portion and the inner edge of said floor portion.

12. A unitary structure comprising a complete car side wall, one longitudinal half of a car floor, and car end portions extending between the ends of said side wall and floor.

13. A unitary structure comprising a car side wall portion, approximately one longitudinal half of a car floor portion, and a triangular web connecting the ends of said portions and extending from their juncture to a line joining the top of the side wall portion with the inner edge of the floor portion.

14. A railway car structure consisting of two units, each comprising approximately a longitudinal half of the car body and a part of the car underframe formed integrally with each other, said units being joined together throughout the length of the car.

15. A railway car consisting of two units extending longitudinally of the car, one unit comprising approximately a half of the car floor with an integral center sill depending therefrom, and the other unit comprising the remainder of the car floor with depending elements for attachment to said center sill.

16. A railway car consisting of two units extending longitudinally of the car, one unit comprising approximately a half of the car floor with an integral center sill depending therefrom, and the other unit comprising the remainder of the car floor with depending elements for attachment to said center sill, and a side wall extending upwardly from the outer edge of the floor portion of each unit.

17. A railway car structure consisting of two units each comprising approximately a longitudinal half of the car body and a depending sill element, said units being joined together throughout their length and cooperating to form a single box section center sill.

18. A railway car structure consisting of two units, each comprising approximately a longitudinal half of the car body with transverse transoms extending outwardly therefrom, said units being joined together throughout their length to form a single box section center sill, and transverse transoms extending from side to side of the car.

19. A railway car structure consisting of two units extending longitudinally of the car and each comprising approximately one longitudinal half of the car floor and one side wall and an end wall element bracing said floor portion and said side wall.

20. A railway car structure consisting of two units extending longitudinally of the car and each comprising one half of the car floor and one side wall and a triangular web extending transversely of said floor and wall from the juncture of the latter to a line extending from the top of said side wall to the inner portion of said floor, and an end wall

element connecting said triangular webs to each other to complete the car end wall.

21. A railway car structure consisting of two units each comprising approximately a longitudinal half of the car body and a part of a center sill web depending from the car body along its longitudinal center line, said units being joined together throughout the length of the car.

22. A railway car consisting of two units extending longitudinally of the car, one unit comprising approximately one half of the car floor with an integral center sill web depending therefrom along its inner edge, and the other unit comprising the remainder of the car floor with an extension overlapping the car floor portion of the first unit and with an integral center sill web depending therefrom and secured to the web of the first unit and cooperating therewith to form a single center sill for the car structure.

23. A railway car comprising two units extending longitudinally of the car, each unit including a vertical web with a flange along its lower edge and a car floor web along its upper edge, said units having their webs secured together to form a car structure with a substantially single I beam section center sill.

In testimony whereof I hereunto affix my signature this 29th day of July, 1930.

H. M. PFLAGER.