April 19, 1938. W. M. SHEEHAN 2,114,819

RAILWAY CAR UNDERFRAME

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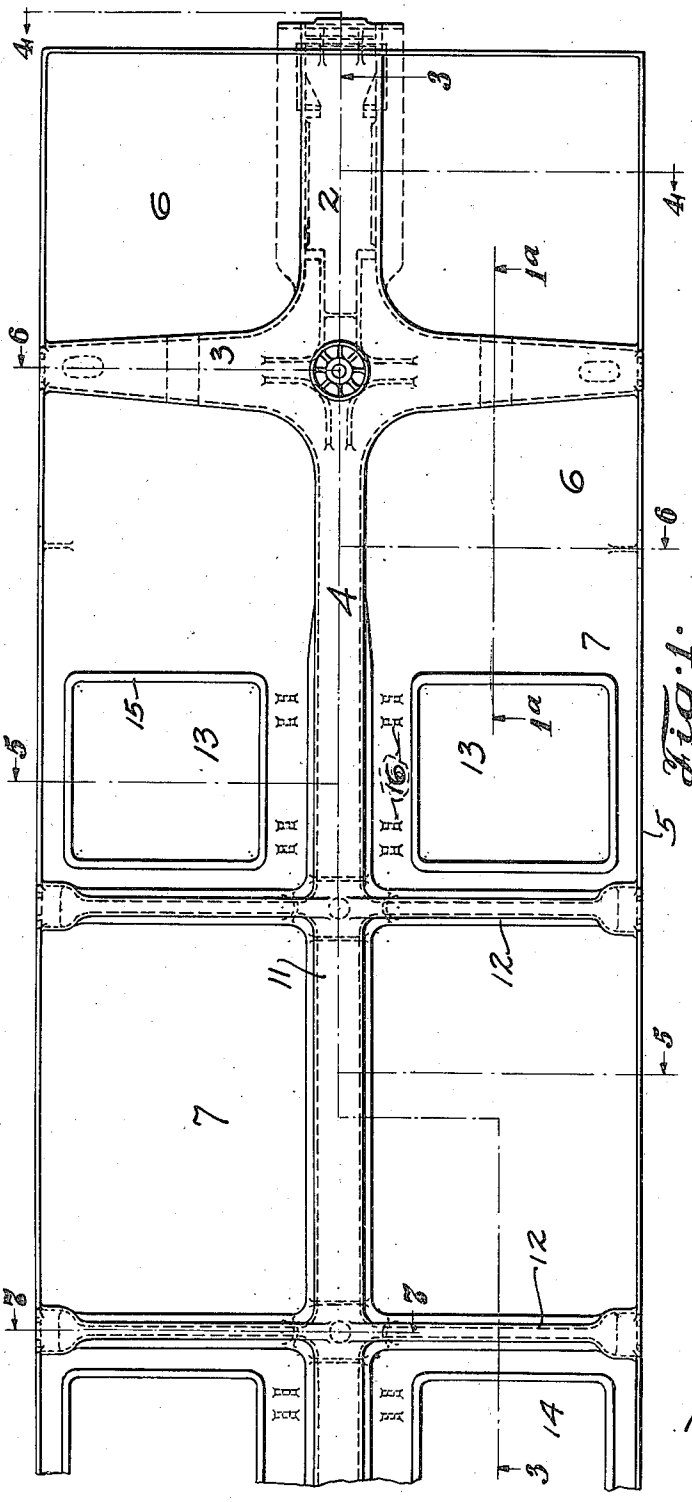


Fig. 1.

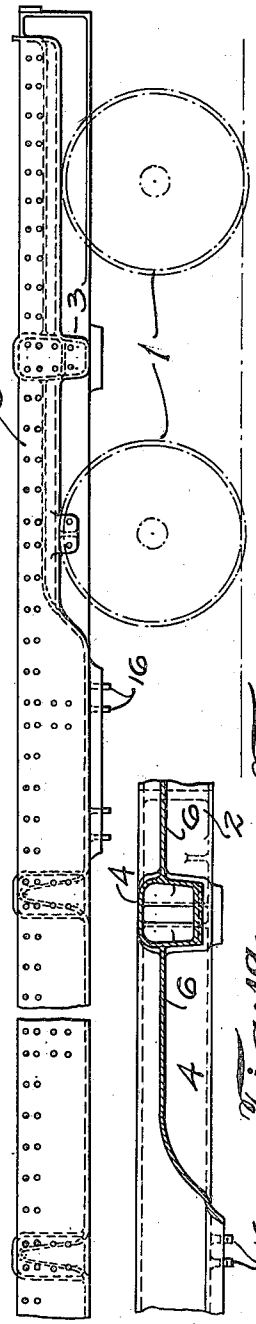


Fig. 2.

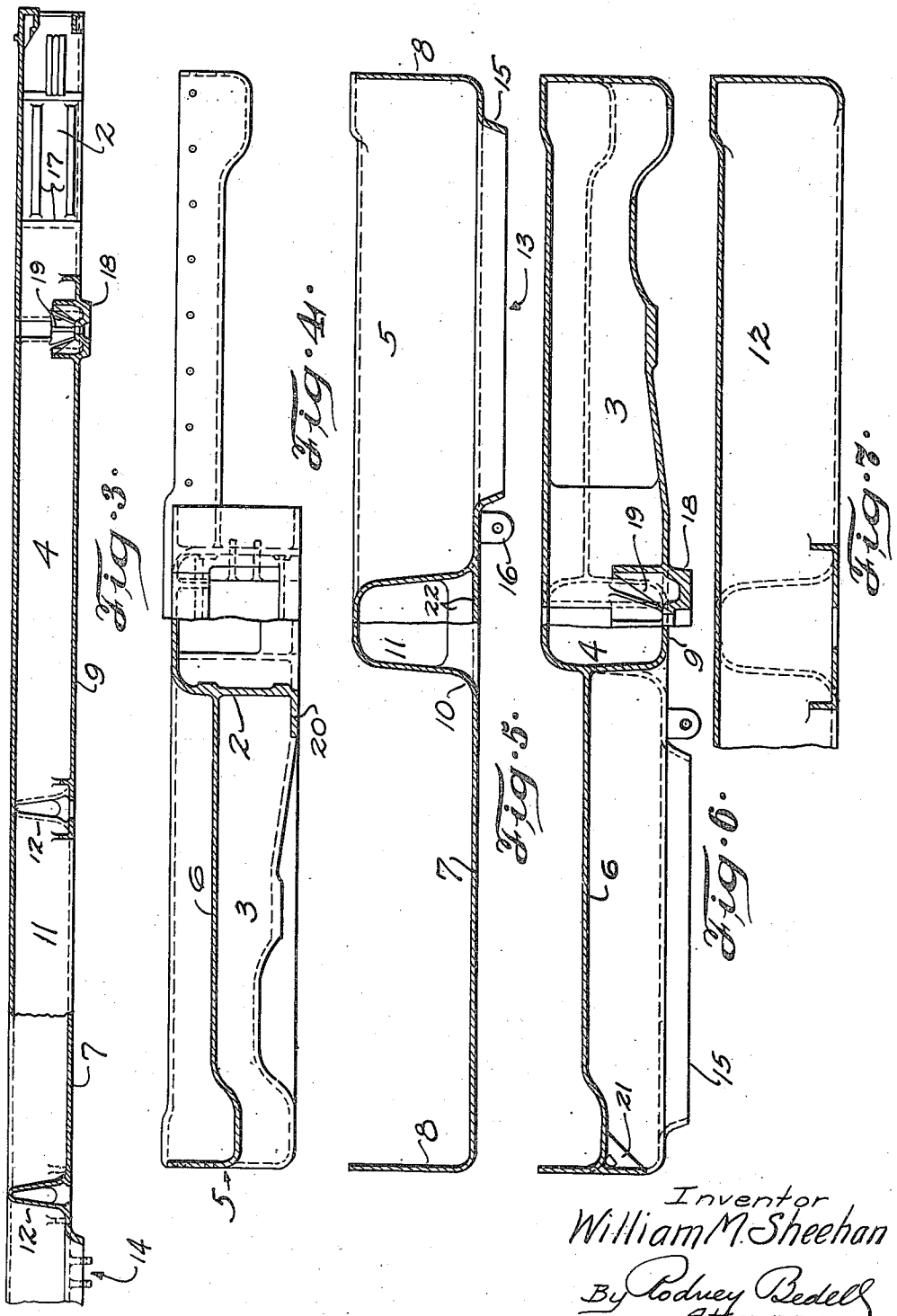
Fig. 1a.

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RAILWAY CAR UNDERFRAME

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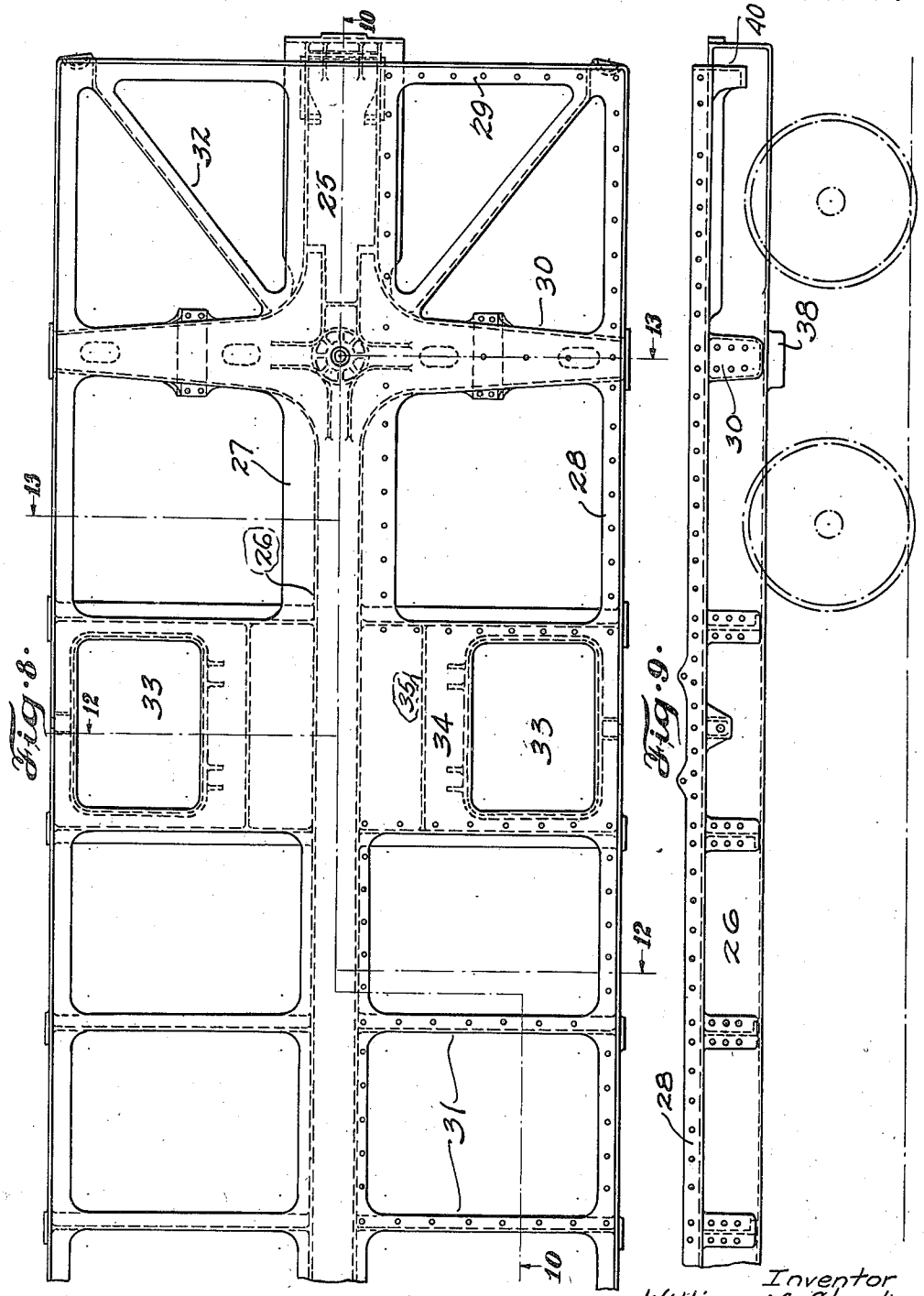


Fig. 8.

Fig. 9.

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RAILWAY CAR UNDERFRAME

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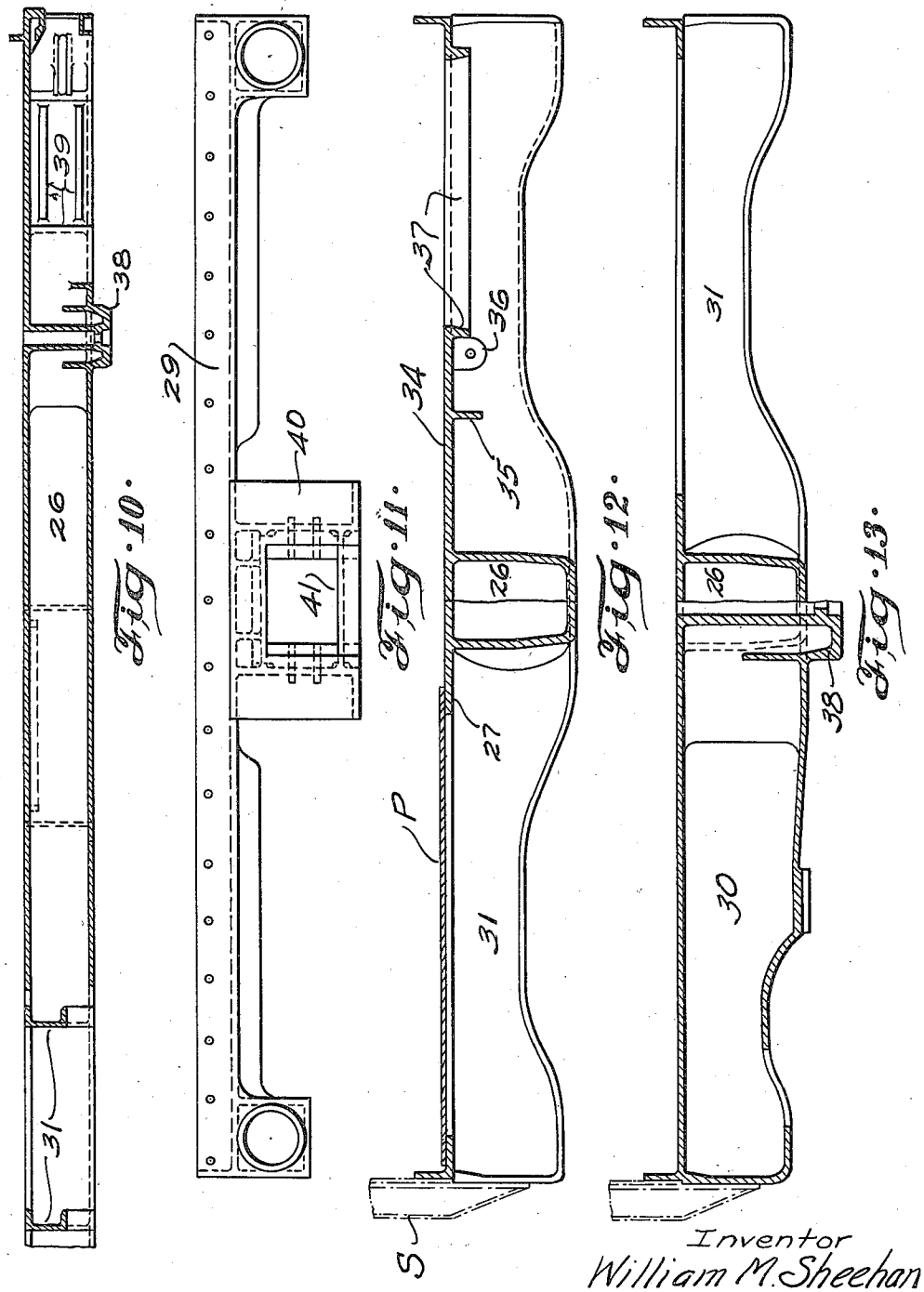


Fig. 10.

Fig. 11.

Fig. 12.

Fig. 13.

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UNITED STATES PATENT OFFICE

2,114,819

RAILWAY CAR UNDERFRAME

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Application April 5, 1937, Serial No. 134,999

7 Claims. (Cl. 105—415)

The invention relates to railway rolling stock underframe structure and is particularly adapted for use in freight car underframes which are to be cast in large units, preferably substantially the entire underframe comprising a single casting.

The objects of the invention are to simplify and strengthen structure of the type referred to, without using an undue amount of metal, and to facilitate the casting of units of the type mentioned with a minimum use of cores.

Preferably the underframe will be of the type in which a portion of the load may be discharged through openings in the floor, such as may be used in dumping gondola cars, ore cars, etc., and it is a further object of the invention to facilitate the inclusion of such dumping door structure in a car of this type.

In the accompanying drawings illustrating selected embodiments of the invention—

Figure 1 is a top view of one-half of a car underframe.

Figure 1*a* is a detail cross section through the bolster and associated structure and is taken on the line 1*a*—1*a* of Figure 1.

Figure 2 is a side elevation of the structure shown in Figure 1.

Figure 3 is a longitudinal vertical section taken on the line 3—3 of Figure 1.

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

Figures 8 and 9 correspond to Figures 1 and 2 but illustrate a modified form of the invention.

Figure 10 is a longitudinal section taken on the line 10—10 of Figure 8.

Figure 11 is an end view of the underframe shown in Figures 8 and 9.

Figures 12 and 13 are vertical transverse sections taken on the corresponding section lines of Figure 8.

The end portion of the underframe overlies the trucks and must be shallow enough, particularly at the sides, to clear the truck wheels indicated at 1. This part of the underframe embodies draft sill structure 2 of inverted U section, bolster structure 3 of box section, center sill structure 4 also of box section, and side sill structure 5 comprising relatively shallow angle sections, the horizontal flanges of which merge with the elevated floor-forming webs 6. Throughout this portion of the underframe the elevated floor web 6 merges with the side walls of the center sill, draft sill, and bolster intermediate the top and bottom of these walls, as best shown in Figures 4, 6 and 1*a*, there being a depression in the floor web near the side sill slightly increasing the depth of the latter and the capacity of the car.

Inwardly of the trucks the floor is offset downwardly, as indicated at 7, the upright web 8 of the side sills being increased in depth accordingly and the bottom wall 9 of the center sill being eliminated, the corresponding edges of the side walls of the center sills being arcuately merged with floor 7, as indicated at 10, the center sill structure again assuming an inverted U-shaped section 11, the walls of which diverge downwardly as best shown in Figure 5. The structure is braced intermediate the bolsters by transverse transoms 12 of inverted U or inverted V sections, the side walls of which diverge downwardly. These transoms extend from center sill to side sill and merge with these sills and with the floor web 7.

Openings 13 and 14 are provided in the floor web to facilitate discharge of material from the car, and these openings are surrounded by downturned flanges 15 to which cooperating doors (not shown) may be applied, hinged lugs 16 being provided integral with the floor web.

Preferably the casting includes draft lugs and stops 17, a center plate 18 with radial reinforcing ribs 19, flanges 20 along the draft sills, side post brackets 21 on the side sills, and ties 22 between the center sill walls adjacent the transoms.

In the modification illustrated in Figures 8 to 13, the main load carrying and force resisting elements of the underframe are retained but the continuous floor web is eliminated. The center member of the underframe includes draft sill structure 25 of inverted U section, corresponding to that shown in the form previously described, center sills 26 of box section extending from bolster to bolster and having their top walls projecting outwardly beyond the side walls to form flanges 27. The side sills 28 and end sills 29 are of angle section and merge one with the other. The bolsters 30 are of box section corresponding to the bolsters previously described. The transoms 31 are of channel section with their inner ends deepened to merge with the bottom of the center sill and with their outer ends deepened and widened to provide increased rigidity of the side sill and to mount the side stakes or posts S. Diagonal braces 32 extend from the corners of the car to the portions of the bolster adjacent the draft sill. Floor plates P are supported upon the center sill, side sill, transoms, bolsters and end sills as indicated. The center sill structure and the side sill structure are each substantial-

ly uniform in depth throughout their length and the floor is at the same level throughout its length.

Adjacent the door openings 33 the center sill top flanges 27 are extended, as indicated at 34, to form an extended floor portion, and webs 34 are reinforced by ribs 35 and include as integral parts thereof the hinge lugs 36 and downturned flanges 37 on webs 34, the adjacent transoms and side sills defining the door opening, as do the flanges 15 in the form previously described.

Preferably the cast structure includes as integral parts thereof, center plates 38, draft lugs and stops 39, and striking plates 40 including coupler carriers 41.

In each form of the invention, the entire floor or substantial parts thereof consist of webs integral with the sill structures and serving to reinforce the latter and the frame generally, and in the form first described, particularly, the floor may be located at any level or at different levels as may be desired for convenience in manufacture or use without encountering any difficulties due to assembling floor sheets and supporting brackets therefor with the sill, bolster and transom structures, such as might be involved if the underframe were filled up in the usual manner with a plurality of structural shapes, angle iron connections, floor plates, etc.

The advantages set forth in the introductory portion of the specification are obtained by the cast structure described, but it will be understood that features of the invention could be well embodied in smaller cast units and in some instances may be embodied in built-up structure rather than cast structure. These changes in the form of the invention and other modifications as may occur to those skilled in the art may be made without departing from the spirit of the invention and the exclusive use of such variations as come within the scope of the claims is contemplated.

I claim:

1. A railway car underframe and floor structure comprising a center sill, a side sill, an end sill, a bolster, and a transverse transom spaced therefrom, and a floor end portion positioned at a level intermediate the top and bottom of said center sill and transom and extending between the center sill and the side sill and inwardly from said end sill to a point between said bolster and transom and then being offset downwardly to the level of the bottom of said center sill and transom and merging with the lower edges thereof.

2. A structure as described in claim 1 in which the floor and said sills, bolster and transom structure comprise a continuous web cast unit.

3. A structure as described in claim 1 in which the floor and said sills, bolster and transom structure comprise a continuous web cast unit, there being dump door openings in the floor-forming member surrounded by downwardly inclined flanges on the floor member constituting a dumping door frame.

4. In a railway car underframe, a center sill of inverted U section, a floor-forming web having an end portion located at a level intermediate the top and bottom of said section and merging with the legs thereof, said floor forming web also having a portion spaced longitudinally of the car from said end portion and located below said level and merging with the bottom of said section, said web extending outwardly from said center sill to the sides of the underframe, and side sills extending upwardly from said floor portions and increasing in depth at points remote from the ends of the underframe.

5. In a railway car underframe, a center sill extending from end to end of the car and including an upright wall, a floor-forming web extending from end to end of the car and having vertically offset portions at different points longitudinally of the underframe, said web portions being continuous with each other and merging with said wall below the top of said sill.

6. In a railway car underframe of the class described an end sill, a bolster, a side sill, a floor having an end portion extending from said end sill to said bolster and arranged at a level above the level of the bottom of said sill, said floor being depressed adjacent said side sill substantially throughout the length of said portion and merging with the lower edge of the latter.

7. In a car of the class described, an underframe, and a floor structure elevated at its end to clear the car truck, there being a center sill of substantially uniform depth from end to end of the car and there being a side sill deeper in section intermediate the car truck than over the latter, there being a floor member offset vertically longitudinally of the car and having end and intermediate portions with their inner edges merging with the intermediate portion and the bottom portion, respectively, of said center sill and with its outer edge merging with the bottom of said side sill substantially throughout the length of the latter.

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