

Oct. 29, 1935.

E. G. HALLQUIST ET AL

2,019,304

RAILWAY CAR

Filed May 5, 1933

4 Sheets-Sheet 1

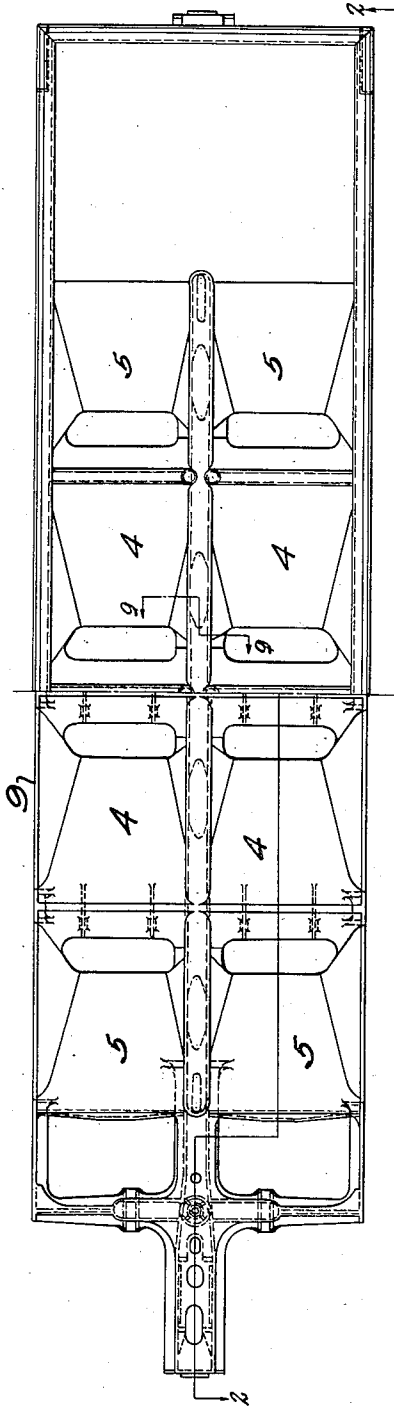


Fig-1-

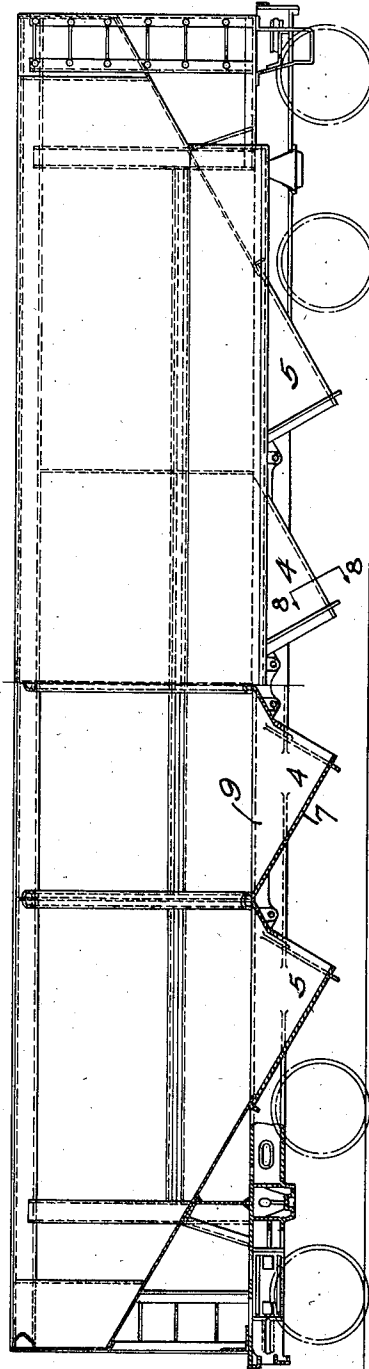


Fig-2-

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4 Sheets-Sheet 2

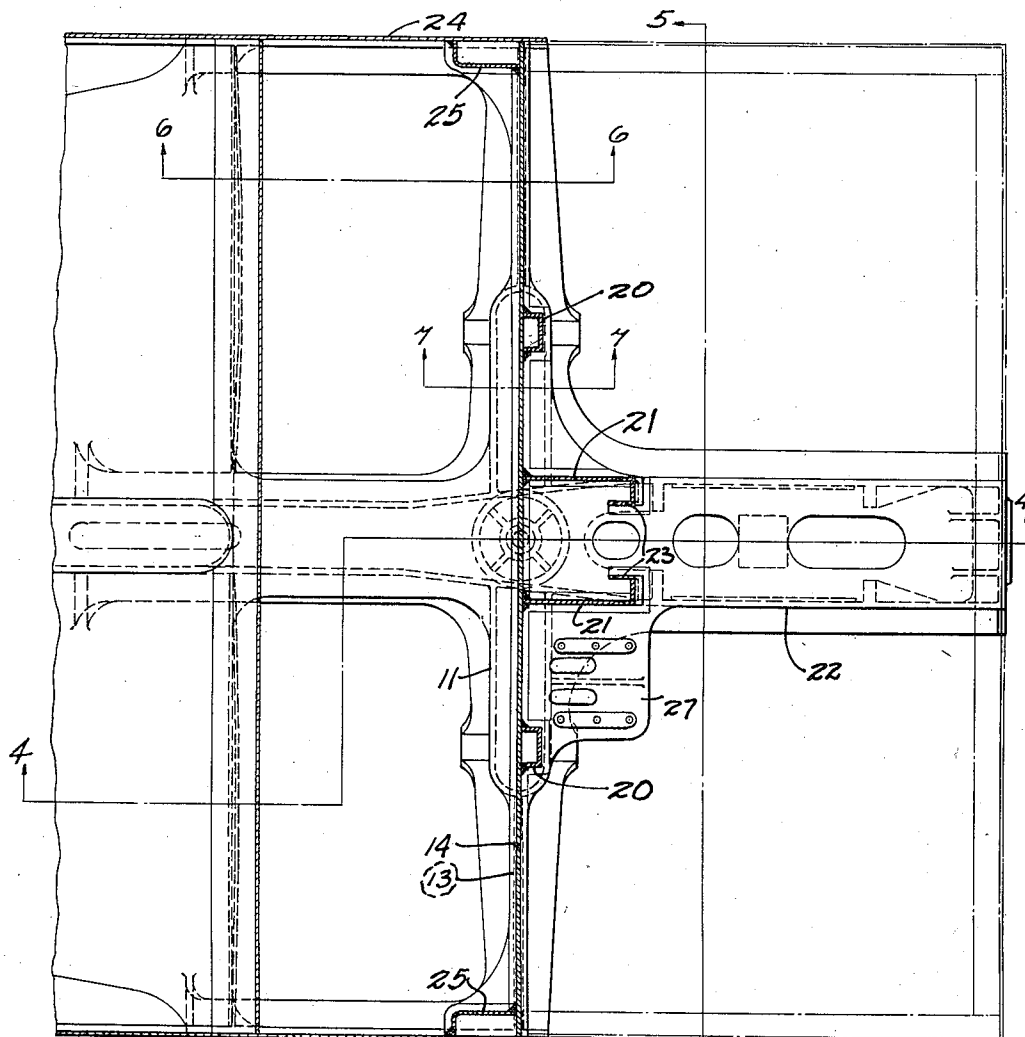


Fig-3- 24

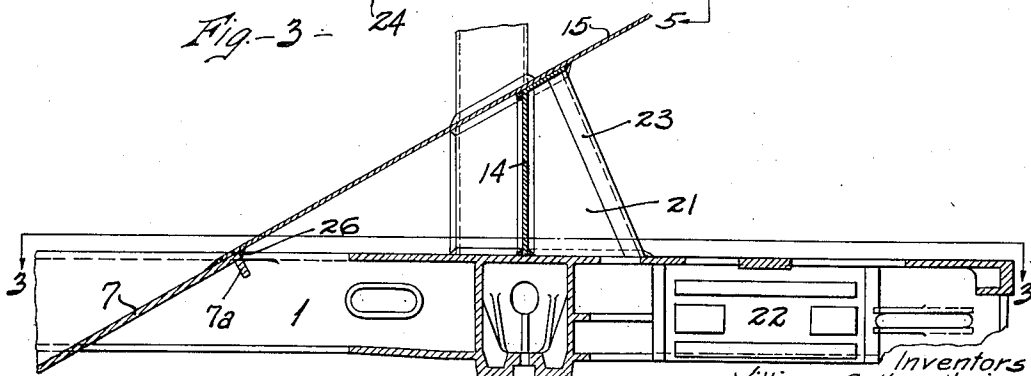


Fig-4-

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4 Sheets-Sheet 3

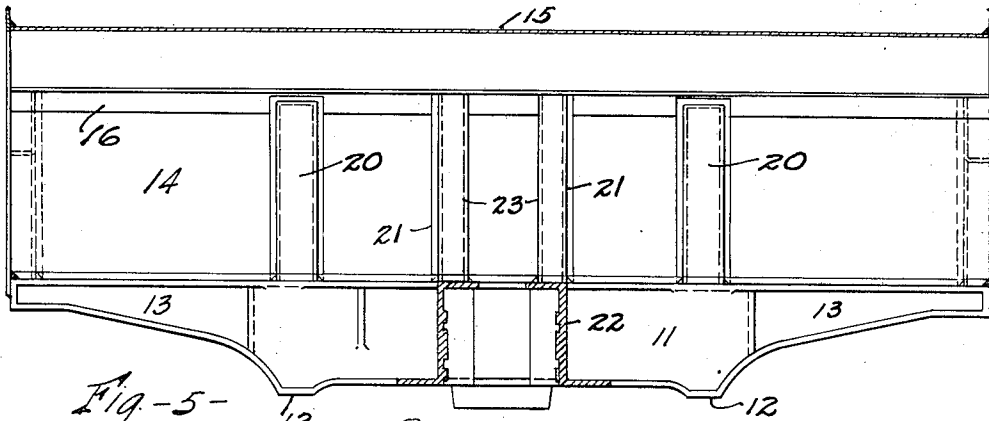


Fig-5-

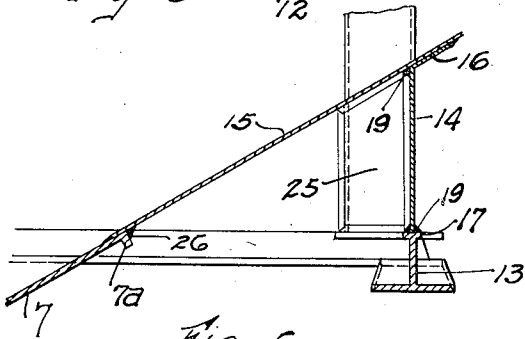


Fig-6-

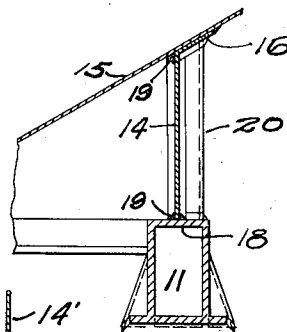


Fig-7-

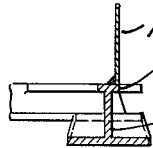


Fig-10-

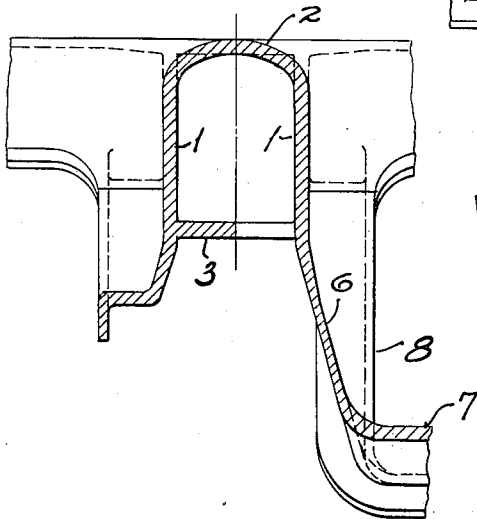


Fig-9-

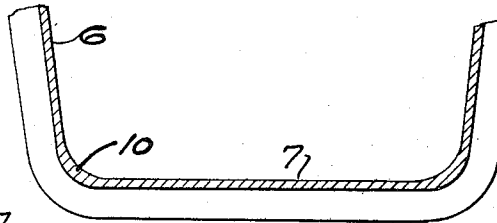


Fig-8-

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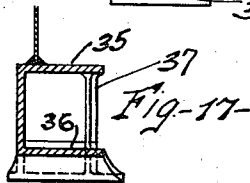
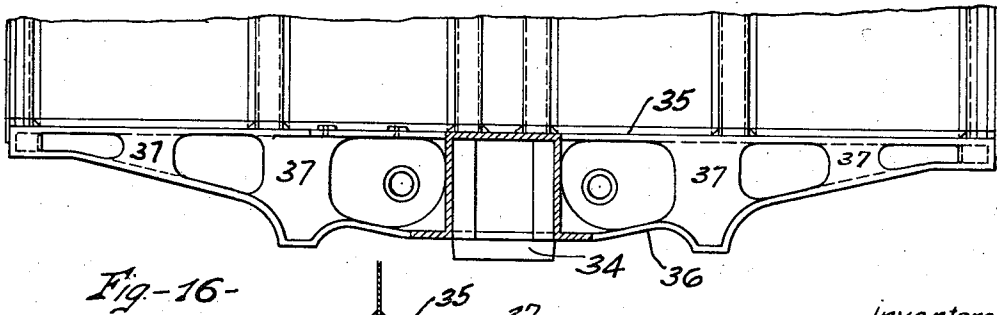
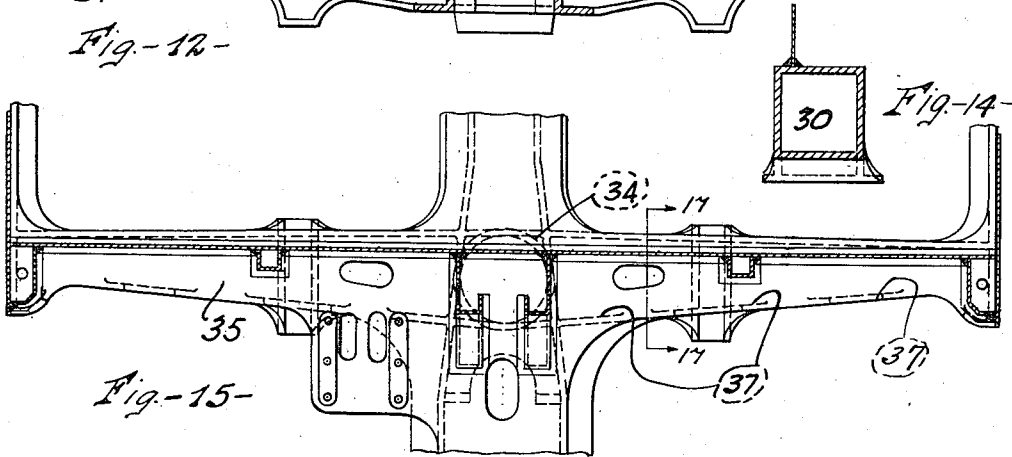
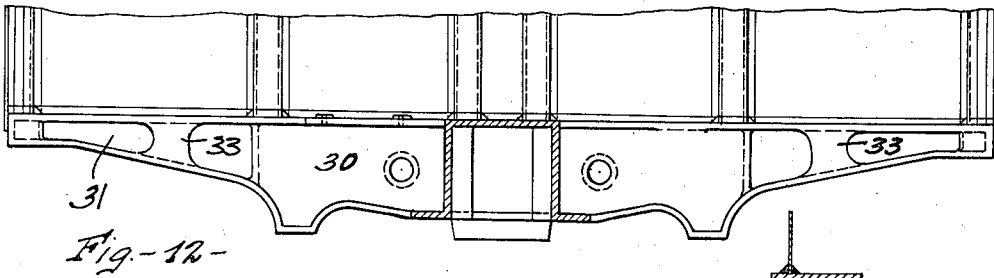
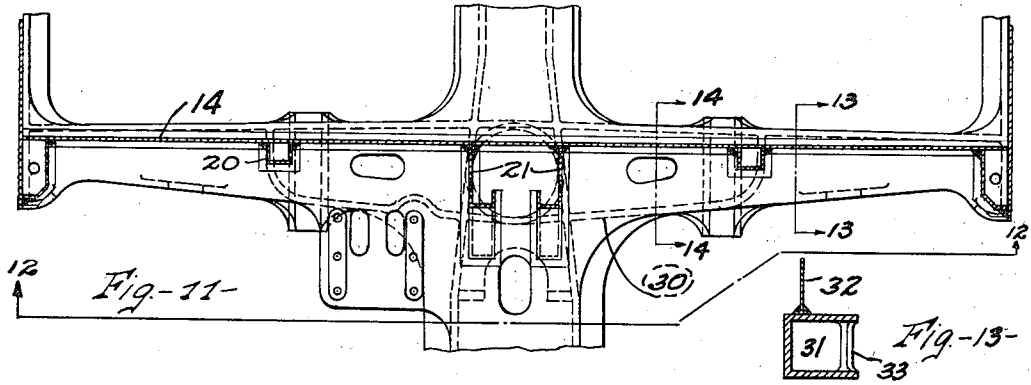
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RAILWAY CAR

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,019,304

RAILWAY CAR

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Application May 5, 1933, Serial No. 669,486

4 Claims. (Cl. 105—249)

This invention relates to railway rolling stock and consists in novel underframing and associated structure particularly adapted for hopper car construction in which a sloping end floor overlies a bolster.

In one type of car construction the underframe consists largely, or in part, of a casting and the superstructure applied to the underframe consists mainly of rolled plates and structural shapes. It is a growing practice to secure this superstructure to the underframe by welding their adjacent elements to each other, and it is one object of the present invention to facilitate the formation of such welded connections.

Another object of the present invention is to provide a strong, light bolster construction embodying a combination of underframe casting and structural elements projecting upwardly therefrom to support a sloping end floor.

Another object of the invention is to provide a bolster structure of the type mentioned in the preceding paragraph which may be varied readily in the building of each car to accommodate differences in the spacing of the inclined floor from the underframe casting.

Another object of the invention is to produce a hopper construction which will be better adapted to withstand the corrosive action arising from the presence of certain acid elements in the lading carried in the hoppers and will better discharge the lading.

These and other detailed objects are attained in the structure illustrated in the accompanying drawings, in which—

Figure 1 consists in the right hand portion of the top view of a hopper car, and in the left hand portion of the car underframe.

Figure 2 is an elevation and longitudinal vertical section taken on the line 2—2 of Figure 1.

Figure 3 is a horizontal section and top view of one end of the car and is taken on the line 3—3 of Figure 4.

Figure 4 is a vertical longitudinal section through the end of the car and is taken on the line 4—4 of Figure 3.

Figure 5 is a vertical transverse section taken on the line 5—5 of Figure 3.

Figures 6 and 7 are detail longitudinal vertical sections taken on the lines 6—6 and 7—7 of Figure 3.

Figure 8 is a detail substantially vertical transverse section taken on the line 8—8 of Figure 2.

Figure 9 is a vertical transverse section taken on the line 9—9 of Figure 1.

Figure 10 is a detail corresponding to a portion

of Figure 6 but illustrating a modification of a portion of the bolster construction.

Figure 11 illustrates a modified bolster construction and is a horizontal section corresponding to a portion of Figure 3.

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

Figures 13 and 14 are vertical transverse sections of the bolster taken on the corresponding section lines of Figure 11.

Figures 15 and 16 correspond to Figures 11 and 12 but illustrate another modification.

Figure 17 is a detail cross section of the bolster taken on the line 17—17 of Figure 15.

Preferably the underframe structure is cast in one piece and includes a box-like center sill extending from end to end of the car, having side walls 1, an arched top wall 2 and a bottom wall 3. The hoppers 4 and 5 are cast integral with the underframe, and the side walls 1 of the center sill are extended at intervals, as indicated at 6, to form the depending sides of the hoppers. These depending portions 6 may be thinner than the upper portions 1, with the thinner and thicker sections gradually merging with each other to facilitate molding and reduce shrinkage stresses. The construction of the center sill and depending hopper sides forms a continuous seamless surface over which the lading may slide freely and in which there are no crevices to collect dirt and moisture with resulting corrosive action.

The transverse walls 7 and the door frames 8 of the hoppers are also part of the casting and merge with the side elements 9 to brace the underframe transversely. Elements 6 and 7 are joined with rounded portions 10, which are increased in section to prevent localization of stresses at the corners and to better resist the corrosive action likely to result from carrying wet material, and particularly lading having acidic action such as arises from a sulphurous content of coal.

The bolster portion of the casting preferably includes a box-shaped section 11, extending between side bearings 12, and a single vertical web section 13 extending from the side bearings to the side of the car. The bolster structure is completed by the use of a vertical plate 14 extending upwardly from the cast portion 11—13 to the sloping end floor 15, where the plate 14 is bent over, as at 16, and secured to the end floor 15.

Bolster web 13 is provided with a flange 17 along its upper edge. The presence of this flange 17 and the top wall 18 of the central portion of the bolster, and the connecting of the adjacent por-

tions of plate 14 to the bolster by means of welded joints 19, makes it possible for the workmen to shift plate 14 longitudinally of the car until it fits closely between the casting and the sloping end floor 15, whereby any variation in the space between these parts is readily accommodated without the necessity of trimming or fitting the parts.

In other words, while the underframe may be designed so that plate 14 is in vertical alinement with web 13 (see Figure 6), if some castings should be somewhat shorter in the distance between center lines of the bolsters, it would be a simple matter to shift the plate longitudinally of the casting, as illustrated in Figure 10, in which the plate 14' extends upwardly from the edge of flange 17' without any diminution of the strength of the bolster and without any variation in the contour of the plate 14', which will be a duplicate of the plate 14. Similarly, if some castings should be longer than the normal shown in Figure 6, the plate extension of the bolster would shift to the other side of the bolster web.

The portions of plate 14 between the side bearings are further reinforced by the application of channel-shaped stiffeners 20 extending upwardly over the side bearings, and by triangular reinforcing members 21 extending upwardly and inwardly from the draft sills 22 to the inclined floor 15 at a point spaced a short distance from the junction of plate 14 with the floor. The outer edges of plates 21 are bent, as shown at 23 (Figure 4), to form reentrant reinforcements. Since elements 14, 15, 20 and 21 are all welded to each other and to the underframe casting, these parts may be assembled without the necessity of providing suitable flanges for riveting and without requiring the provision of spaces around joined parts to accommodate riveting tools.

The outer ends of webs 14 are braced to the superstructure side sheets 24 by means of angle-like elements 25 welded along their edges to plates 14 and 24, respectively.

The convenience of the welding assembly is utilized in connecting the lower ends of floors 15 with the upper ends of corresponding hopper walls 7 (see Figure 4), and a right angle flange 7a on the hopper wall forms a convenient pocket with the adjacent portion of end floor 15 for receiving the welding metal 26.

As best shown in Figure 3, the underframe includes a brake cylinder bracket 27 projecting outwardly from the top wall of the bolster and center sill and forming the upper gusset between them at one corner of the intersection of the bolster and draft sill structure.

Among the various modifications of the construction described above which will utilize the novel features thereof is that illustrated in Figures 11 and 12 in which the box section between the side bearings is retained, as shown at 30 in Figure 14, but the vertical web section from the side bearings outwardly is replaced by a channel section 31 (Figure 13) which provides a wide upper flange across which the bolster plate 32 may be moved to the position necessary to properly assemble the same with the sloping end floor.

The outer edges of the bolster channel flanges may be braced by one or more suitable ribs 33.

Figures 15 and 16 illustrate another modification in which the bolster is a channel section substantially throughout its length except immediately over the center plate 34. The upper and lower flanges 35 and 36 of the bolster increase in width towards the center of the car and are braced at intervals by ribs 37. This arrangement provides a strong rigid bolster, but may be made lighter than the box section of the bolsters previously described.

Various other modifications in the details of the construction may be made without departing from the spirit of the invention and exclusive use of those modifications coming within the scope of the claims is contemplated.

What is claimed is:

1. In a railway car, an underframe casting including bolster structure, a sloping end floor having a portion spaced substantially above said structure, a plate supporting said portion from said structure, the opposing elements of said portion and structure being flat to readily accommodate the shifting of said plate to a point where its depth corresponds to the distance between said portion and said casting, a triangular brace sheet for the floor supporting plate extending outwardly and downwardly from the floor in a vertical plane disposed transversely of the plate, and means for securing said plate and brace sheet to said casting at any desired points on the latter adjacent to said bolster structure.

2. A railway car as specified in claim 1 in which the side of said brace sheet spaced from said floor and casting terminates in a reentrant flanged portion, and also including means for securing said plate and brace sheet, including the lower end of said flanged portion, to said casting at any desired points on the latter adjacent to said bolster structure.

3. In a railway car, an underframe casting including bolster structure, a sloping end floor having a portion spaced substantially above said structure, a plate supporting said portion from said structure, the opposing elements of said portion and structure being flat to readily accommodate the shifting of said plate to a point where its depth corresponds to the distance between said portion and said casting, there being transverse reinforcements for said plate extending along the same between said end floor and said bolster structure, and means for securing said reinforcements to said end floor and bolster structure irrespective of the relative position of the latter.

4. In a railway car, a main underframe casting including bolster structure having side bearings, a sloping end floor having a portion substantially above said casting, and a plate supporting said floor portion from said casting, and reinforcements for said plate above said side bearings and comprising upright channel-shaped members with the edges of their flanges secured to said plate to form box structures therewith.

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