Oct. 31, 1939. G. B. DOREY 2,178,034

RAILWAY CAR UNDERFRAME

Filed May 6, 1937 4 Sheets-Sheet 1

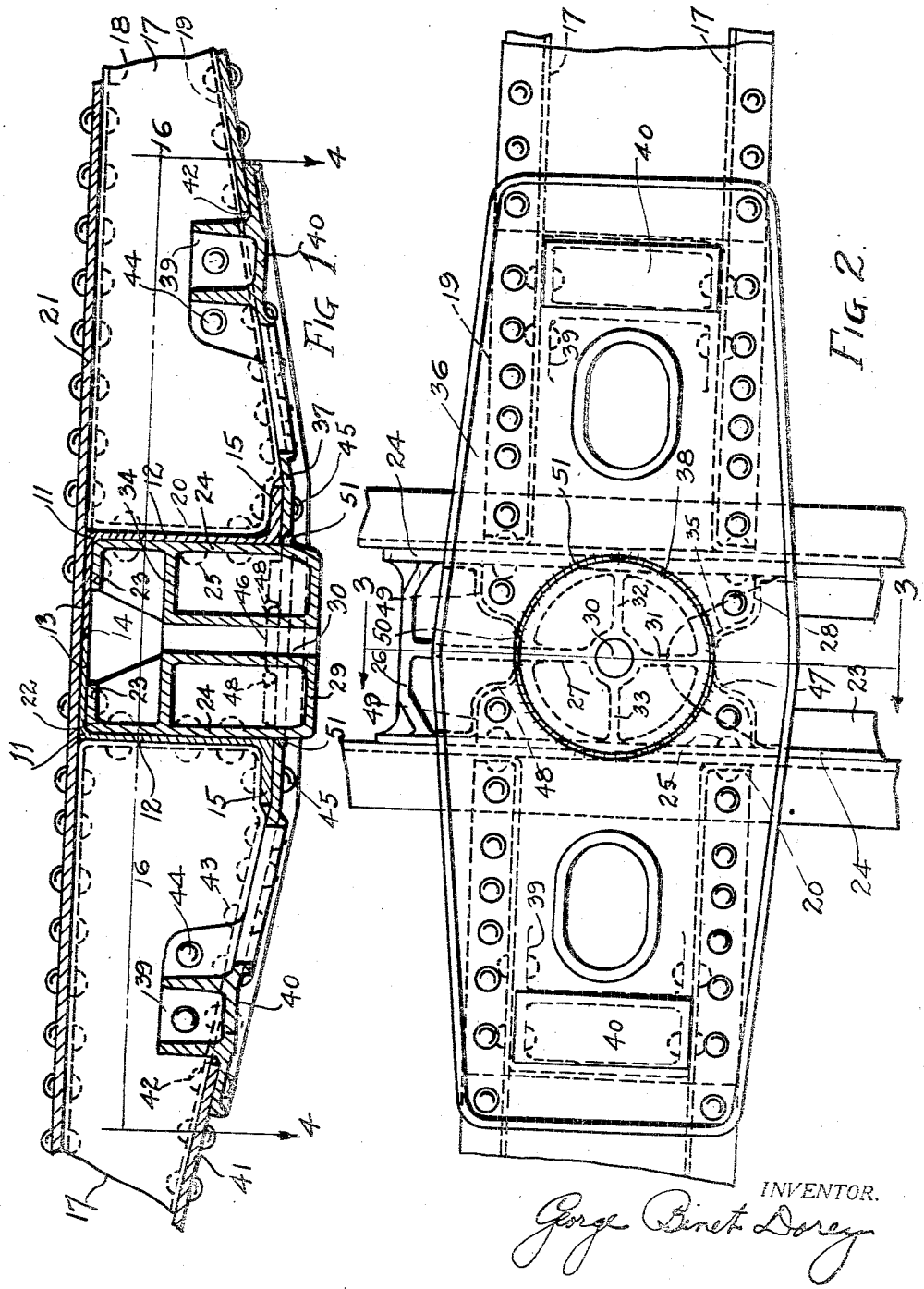


FIG. 1.

FIG. 2.

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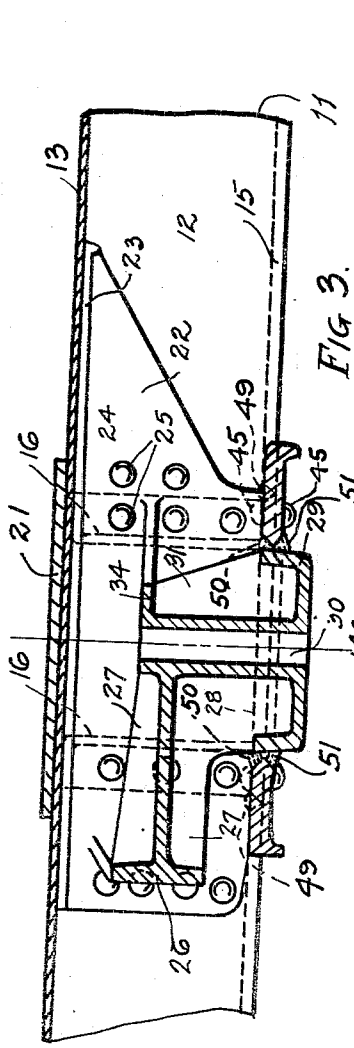


FIG. 3.

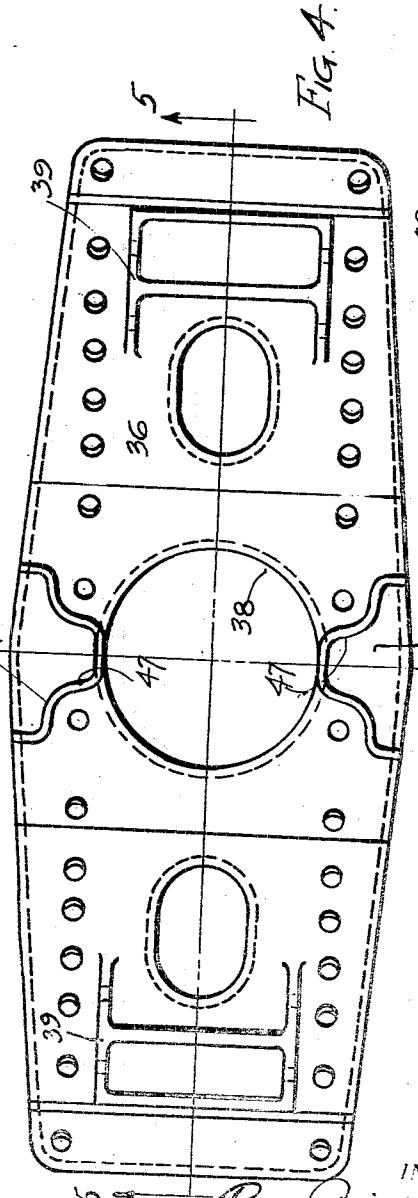


FIG. 4.

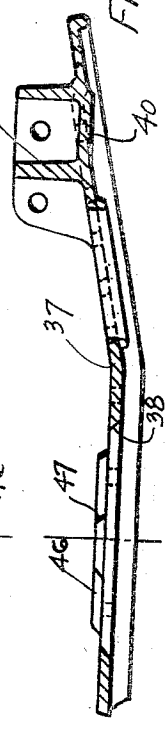


FIG. 5

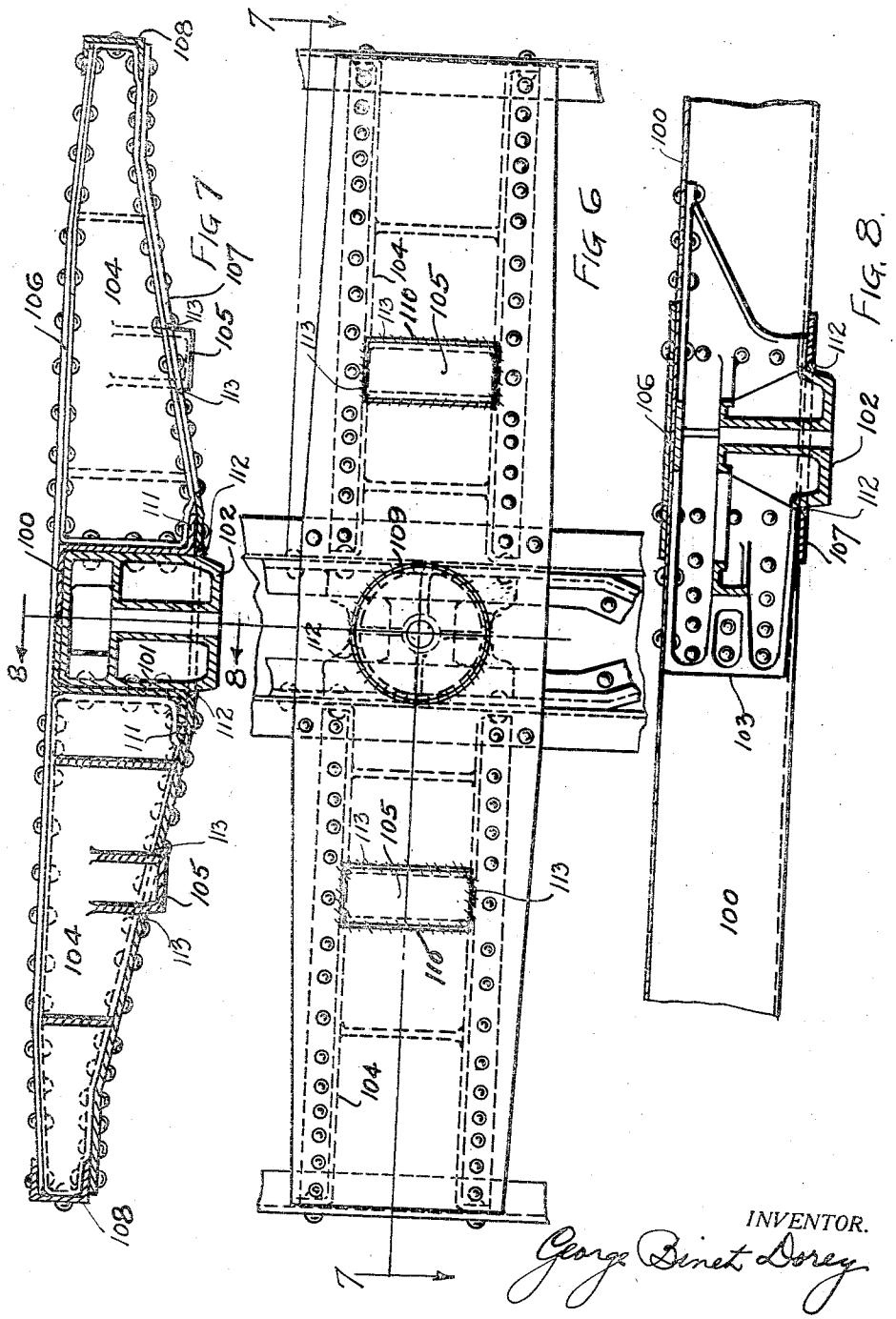
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RAILWAY CAR UNDERFRAME

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RAILWAY CAR UNDERFRAME

Filed May 6, 1937 4 Sheets-Sheet 4

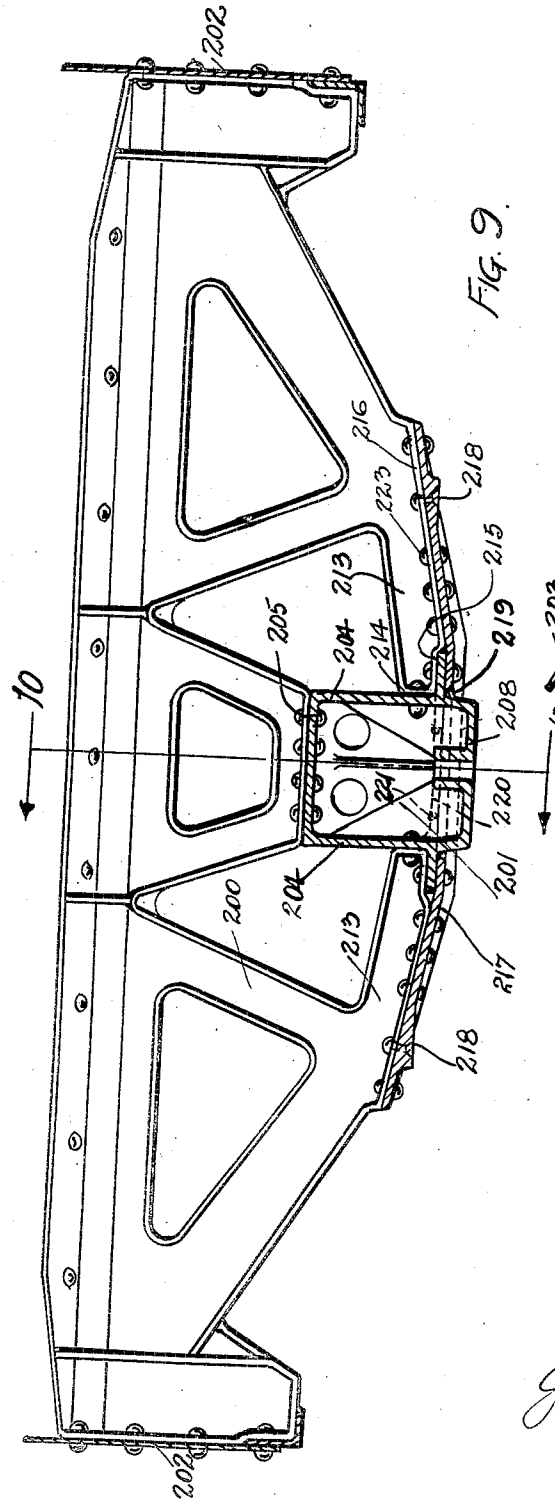


FIG. 9.

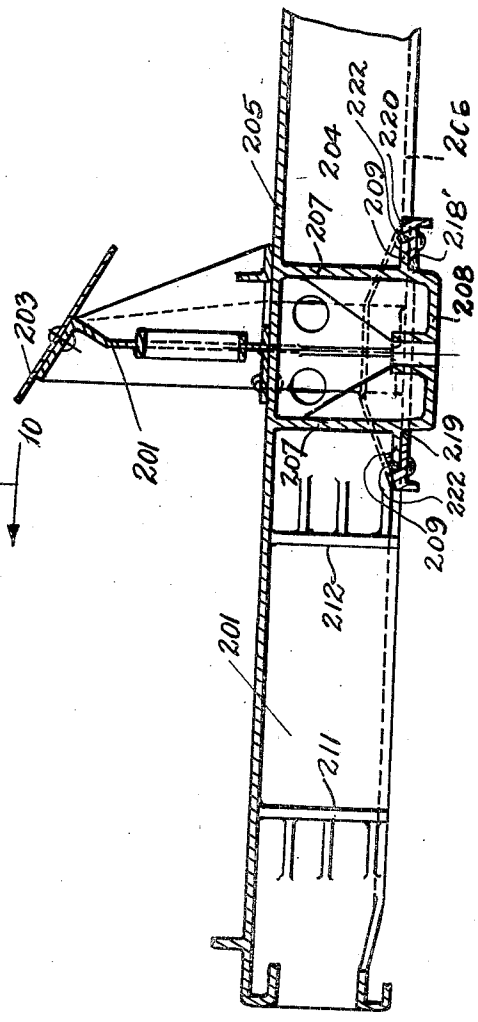


FIG 10.

INVENTOR.

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Patented Oct. 31, 1939

2,178,034

UNITED STATES PATENT OFFICE

2,178,034

RAILWAY CAR UNDERFRAME

George Binet Dorey, Westmount, Quebec, Canada, assignor to Enterprise Railway Equipment Company, Chicago, Ill., a corporation of Illinois

Application May 6, 1937, Serial No. 141,016

4 Claims. (Cl. 105—228)

My invention relates to improvements in railway car underframes and is particularly adapted for use in conjunction with longitudinally extending draft transmitting members having integral center plate structures.

The invention is an improvement on the type of structure as defined by United States Patent No. 2,003,341 granted to Argyle Campbell, June 4, 1935, and relating to Underframe construction for railway cars. In the said type of underframe construction making use of a unitary casting having the center sill filler casting and bolster bottom member cast in one piece, experience has shown that the cost of machining and fitting the parts renders the cost of application very high and furthermore, due to variations in the sizes of the center sill beams, there is great difficulty in obtaining the necessary close fitting of the parts. My improved construction overcomes this objection by providing a construction wherein a longitudinally extending draft member is formed as a separate unit from the transversely extending bottom tie member of the body bolster and provision made for interlocking the respective parts and welding them in operative relation after the parts are fitted together.

Another object of my invention is to provide a construction wherein the longitudinal member may be standardized and any modifications necessary to suit different types of bolsters may be made in the comparatively simple bottom member.

For further comprehension of my invention reference may be had to the accompanying drawings wherein Fig. 1 is a vertical transverse sectional view taken through the central portion of a railway car body bolster, said view showing only so much of the car structure as necessary to show my improved construction with the car structure incidental thereto.

Fig. 2 is a bottom plan view of that part of the car indicated in Fig. 1. Fig. 3 is a longitudinal vertical sectional view taken on a line corresponding substantially to a line 3—3 of Fig. 2. Fig. 4 is a detached plan view of the bolster bottom tie member shown in Figs. 1–3 inclusive, and as viewed on a line 4—4 of Fig. 1. Fig. 5 is a vertical transverse sectional view of slightly more than one half of the bolster bottom tie member, and as viewed on a line 5—5 of Fig. 4. Fig. 6 is a bottom plan view of the body bolster of a railway car and showing a modified form of my invention. Fig. 7 is a vertical transverse sectional view taken through the car and on a line corresponding substantially to a line 7—7 of Fig. 6. Fig. 8 is a vertical longitudinal sectional view taken through the center sill structure and on a line corresponding substantially to a line 8—8 of Fig. 7. Fig. 9 is a vertical, transverse sectional view taken through the lower portion of a railway car, and illustrating my invention as applied in connection with a cast steel body bolster and cast center sill and as applied to a hopper car structure. Fig. 10 is a longitudinal vertical sectional view taken through the car and on a line corresponding substantially to a line 10—10 of Fig. 9.

Referring first to the construction shown in Figs. 1 to 5 inclusive wherein is shown a longitudinally extending center sill structure formed of a pair of Z shaped beams 11—11 arranged with their webs 12 vertically disposed. The top flanges 13—13 of the respective sections face inwardly towards each other and are united along their edges along the longitudinal center of the car by welding as indicated at 14. The lower flange 15 of each Z-beam member 11 faces outwardly of the center sill.

Extending transversely outwardly from said center sill on each side thereof are bolster diaphragms 16—16. These diaphragms are arranged in pairs on each side of the center sill and spaced from each other lengthwise of the car. Each said member 16 is preferably formed of pan shaped formation including a vertical web 17 and continuous flanges as indicated by upper flange 18, lower flange 19 and inner vertical flange 20. Extending transversely of the car above the diaphragms and riveted thereto and with the center sill is the bolster top plate 21.

Extending lengthwise of the car and disposed between the center sills is the draft transmitting element 22. Said element is preferably in the form of a casting having a horizontal top wall 23 bearing against the upper wall or flanges 13 of the center sill and the casting is formed with longitudinal vertical wall sections 24—24 adapted to register with the center sill webs 12—12 respectively and united therewith by means of rivets 25. The respective longitudinal walls are united adjacent the front end of the casting by means of a transversely extending wall 26 which constitutes a rear abutment for the draft gear. The rear abutment wall 26 is braced centrally by a longitudinally extending wall 27.

The lower part of the element 22 is formed with a horizontally extending wall 28, the under face of which is substantially in alignment with the under face of the center sill flanges 15. The central portion of the wall 28 merges into a de-

pressed portion 29 of generally circular formation which constitutes the center plate bearing of the car; said depressed portion is of appreciable depth and at its center is formed with a hollow cylindrical portion 30 which extends upwardly between the center sills. The cylindrical portion is adapted to receive the center pin of the car.

The center bearing plate section is suitably braced by longitudinally and transversely extending walls 31, 32, 33 and the aforementioned vertical wall 27, said respective walls being extended downwardly within the depressed portion of the center plate section and merging into the cylindrical portion 30 to form a column of great strength. Intermediate the upper and lower walls, the center member is reinforced by a horizontally extending wall 34.

The lower horizontal wall 28 is formed at each end with a cutaway portion 35 of substantially channel shape. The body bolster is tied transversely of the car by a bottom tie member 36, which in effect, consists of a flat like body portion 37 having an opening 38 corresponding in shape to the contour of the center plate section and of slightly larger diameter in order to permit the center plate portion to fit readily in the opening. The body portion is positioned below the center sill in such a manner that the upper surface of the tie member bears against the under surface of the center sill flanges 15 and underlies the bottom flanges 19 of the bolster diaphragms 16. Formed integrally with the body portion 37 are the diaphragm spacers 39 which lie between the pairs of diaphragms 16—16 and also constitute bracing means for the side bearings 40. The body portion of the tie member 36 preferably terminates a short distance beyond the side bearings and continuity of reinforcement is effected by means of plates 41 which are welded or otherwise secured to the body portion as indicated at 42. Connection between the bolster diaphragms and the tie member is effected by rivets as indicated at 43 and 44 and connection between the center sill lower flange and the tie member is effected by rivets 45.

The bottom tie member is reinforced on each side of the opening 38 by making that portion of the tie which extends across the center sills of increased thickness, said increased thickness being formed by an upwardly projecting section 46. Said section 46, as will be noted by reference to Fig. 2, is of generally T shape contour and is formed with a portion 47 disposed in the channel shaped cutaway 35 of member 22. The section 46 and wall 28 lie in a common plane and are so arranged as to provide an interlocking joint between the bottom tie member 36 and the top member 22.

The interlocking between the respective members is rendered positive by welding along the edges of the respective sections at the locations indicated at 48, 49 and 50 respectively. The fact that the welds 48, 49 and 50 provide for a welded joint extending both longitudinally and transversely of the car assures additional strength against rupture as compared with a straight line welded joint. The said members 22 and 36 are further united by welding the two parts together around the edge of the opening 38 as indicated at 51.

With the arrangement of the parts as indicated, assembly may be carried out by first applying the center member in position between the center sills in such a manner as to obtain a direct bearing against the under surface of the center sill top flanges; the bottom tie member is then placed in position and bolted or riveted in order to obtain a firm bearing against the lower flange of the center sills. With the parts in operative relation, the welding is then carried out and the structure thereafter functions with the same effect as if the center member 22 and the lower tie plate 36 had been cast as an integral unit in the first instance. This construction of integrally uniting the two sections after the parts have been fitted together provides for proper distribution of bearing strains between the top and bottom center sill flanges irrespective of variations in the center sill vertical dimensions and the necessity for precision machining is eliminated.

In the modification shown in Figs. 6–8 inclusive, 100—100 indicates the center sills, 101 the center member having the center plate 102 formed integrally therewith, said member having at its forward end draft gear abutments 103. On each side of the center sills are bolster sections 104—104, which are preferably formed of cast members, and each having a side bearing 105 projecting downwardly. The top cover plate indicated at 106 extends from side to side of the car and is riveted to the bolster sections. The bottom cover plate 107 likewise extends from side to side of the car and connects with side sills 108—108; said plate is formed with a circular opening 109 and substantially rectangular openings 110—110, the former being adapted to receive the center plate section 102 and the latter being for the reception of the downwardly projecting side bearings 105—105.

The bottom cover plate 107 is disposed in underlying relation with the lower flanges 111—111 of the center sill and with the bolster sections 104—104 and riveted to said respective members. The center member and bolster sections are integrally united to the bolster bottom cover plate by welding at the center plate as at 112 and at the side bearings as at 113. The weld 112 is preferably carried out by forming a continuous weld completely around the center plate and the welds 113 are in similar manner preferably made to form a continuous weld around the four sides of the side bearings. With the parts welded as indicated, it will be apparent that the bottom tie plate, center plate section and side bearings will be integrally united to form a very strong construction and one which may be readily and cheaply made.

In the embodiment of my invention as illustrated in Figs. 9 and 10, my improved construction is shown as applied to the hopper type of car having a sloping end floor and wherein the body bolster and center sills are formed of cast members.

In said construction the body bolster is indicated at 200 and the center sill at 201. The sides of the car are shown at 202 and as will be noted the body bolster extends from side to side of the car and straddles the center sills. The upper part of the bolster is formed with an inclined portion which supports the sloping floor 203. The center sill 201 includes spaced vertical walls 204—204 connected by a top horizontal wall 205 and the vertical walls at their lower portion are reinforced by an outstanding horizontal flange 206. The said vertical walls 204—204, adjacent the body bolster, are connected by transverse vertical walls 207—207 and said last named walls in connection with the center sill webs from a

box like structure below which the center plate section 208 is disposed. The center sill webs are further tied together transversely by a horizontally extending wall 209 which lies on the same level as the flanges 206. On the inner side of the boxlike section the center plate section is braced by suitable ribs 210.

The center sill is provided with front and rear each side of the center sill as indicated at 213 respectively. The center sill as constructed is free from any side projecting portions and may be readily manufactured and stored or shipped without danger of breaking.

The body bolster 200 includes strut portions on each side of the center sill as indicated at 212 which abut against the outer side of the center sill at 214 and also rest on the center sill flange at 215, each said strut portion having substantially horizontally extending flanges 216.

The bolster bottom tie plate 217 extends beneath the center sill and body bolster and is provided with side bearings 218. The tie plate is provided with an opening 218' within which the center plate section fits and welding is effected around the center plate as indicated at 219 in order to integrally unite the center sill and bottom tie. The respective parts are further united by welding an upstanding lug portion 220 to the horizontal wall of the center sill as indicated at 221 and 222. The said lug portion 220 is in effect obtained by providing increased thickness in the body portion of member 217 for a short distance between the center sills.

Should it be necessary for any reason to dismantle a car having the center sill and bottom tie member welded together as indicated, the rivets 223 are severed and the center sill may then be removed with the same ease as if the two parts had originally been cast as a unit and the parts may then be reassembled with the assurance that the parts will fit together.

While I have shown certain preferred embodiments of my invention I contemplate all modifications which come within the scope of the specification and claims appended hereto.

What I claim is:

1. In a railway car underframe, the combination with a center sill member incorporating therewith an integral center plate, of a bolster bottom tie member extending transversely across the center sill and to each side thereof, said member having an opening therein adapted to encircle the center plate, and means adapted to unite the said bottom member and center sill member to function as in integral unit, said uniting means including a welded connection between the center plate and the edge of the opening in the tie member.

2. In a railway car underframe, the combination with a center sill member incorporating therein an integral center plate and integrally formed horizontally extending wall means above the center plate; of a bolster bottom tie member extending transversely across the center sill and adapted to bear on the said wall means, said tie member having therein an opening adapted to encircle the center plate; and means adapted to unite the said bottom member and center sill member to function as an integral unit, said uniting means including a welded joint between the tie member and the center plate, said welded joint extending around the center plate and an additional welded connection between the tie member and the horizontally extending wall of the center sill member.

3. In a railway car underframe, the combination with a longitudinally extending member having a center plate portion of appreciable depth formed integrally therewith; of a bolster section on each side of the longitudinal member and disposed substantially in alignment with the center plate portion, each said bolster section having a side bearing formed therewith; and a bolster bottom tie plate extending beneath the center portion and the bolster sections, said tie plate having openings adapted to fit over the center plate portion and side bearings respectively; and welded connections adapted to extend around the respective openings to unite the center plate portion and side bearings in an integral structure with the bottom tie plate.

4. In a railway car having a center sill including spaced vertical walls and an upper horizontally extending wall connecting said vertical walls, each of said vertical walls having a lower marginal wall extending outwardly horizontally; a foundation member combining in one unit a center sill reinforcement, center plate and bolster bottom tie member, said member having a longitudinally extending portion provided with the center plate portion and adapted to be positioned between the vertical walls of the center sill in such a manner as to provide a bearing against the upper wall of the center sill and having the bolster tie plate formed as a separate piece from the said longitudinally extending portion and adapted to be applied to bear on the lower flange of the center sill; said bolster tie plate having an opening adapted to encircle the center plate portion and be welded thereto after the two components have been placed in operative relation whereby bearing strains will be proportioned between the upper and lower walls of the center sill irrespective of variations in the vertical dimensions of the center sills.

GEORGE BINET DOREY.

CERTIFICATE OF CORRECTION.

Patent No. 2,178,034. October 31, 1939.

GEORGE BINET DOREY.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, first column, line 9, for the words "each side of the center sill as indicated at 213" read draft gear abutments as indicated at 211 and 212; line 15, for "212" read 213; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of December, A. D. 1939.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)