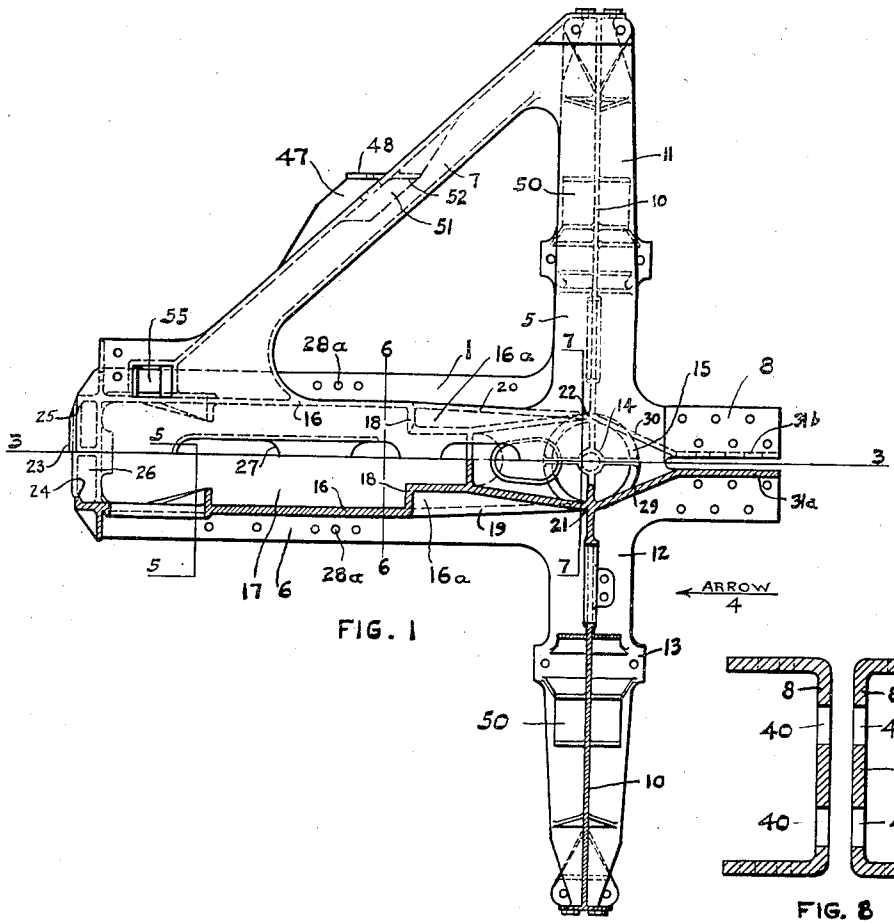
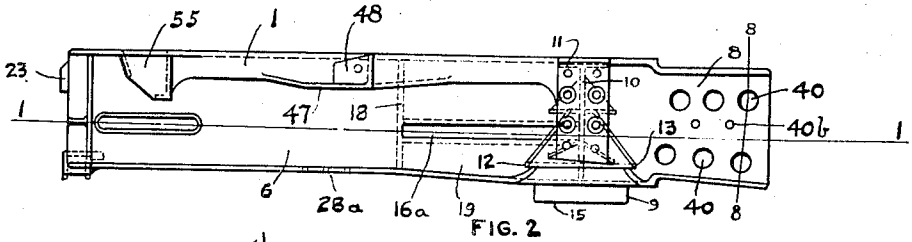
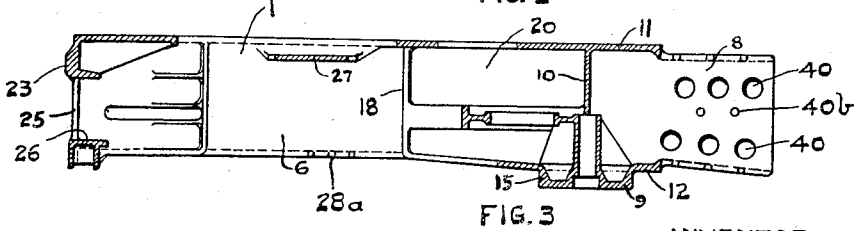
Dec. 24, 1940. J. P. CHRISTIANSEN 2,226,091

CAR CONSTRUCTION

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CAR CONSTRUCTION

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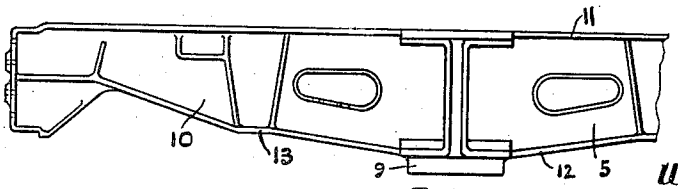


FIG. 4

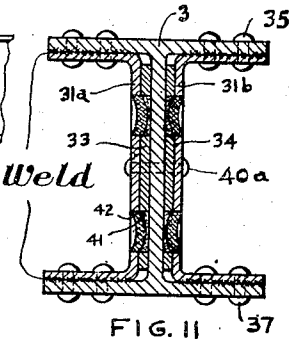


FIG. 11

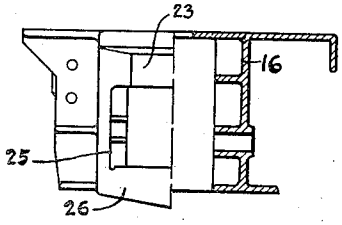


FIG. 5

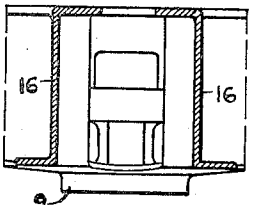


FIG. 6

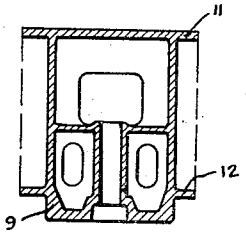


FIG. 7

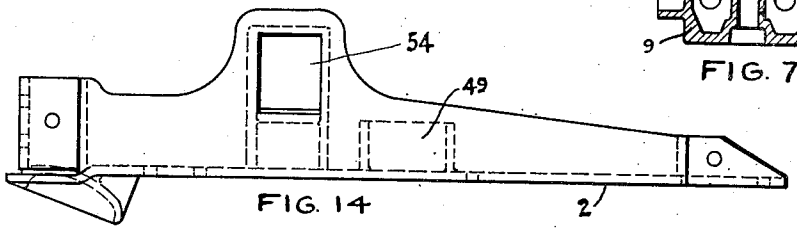


FIG. 14

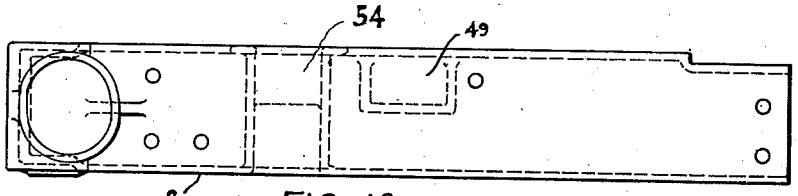


FIG. 13

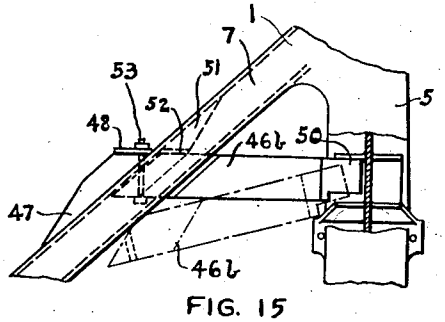


FIG. 15

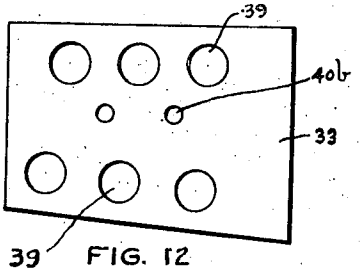


FIG. 12

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CAR CONSTRUCTION

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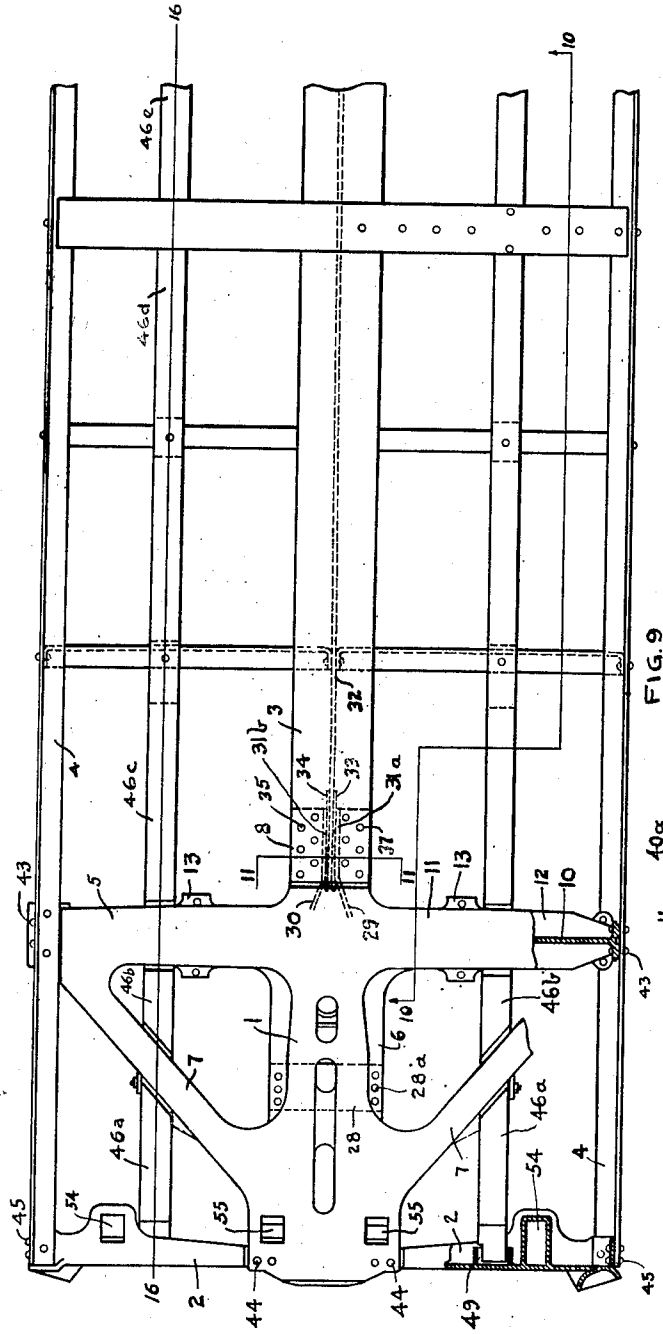


FIG. 9

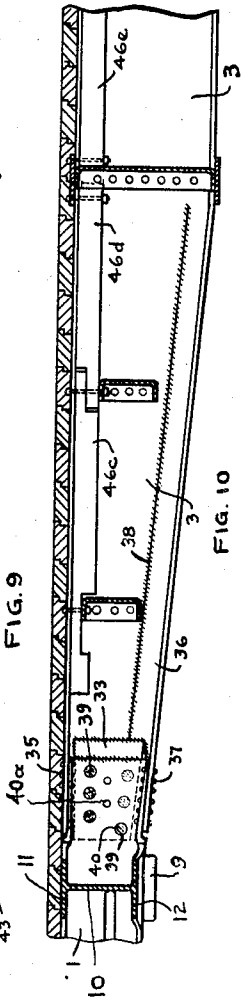


FIG. 10

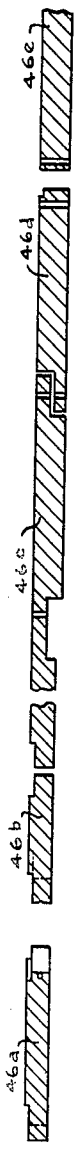


FIG. 16

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2,226,091

UNITED STATES PATENT OFFICE

2,226,091

CAR CONSTRUCTION

James P. Christiansen, West Lafayette, Ind., assignor to Unitcast Corporation, Toledo, Ohio, a corporation of Ohio

Application September 26, 1939, Serial No. 296,533

2 Claims. (Cl. 105—414)

This invention relates to car construction and has as a particular object to provide means suitable for flat or other cars whereby a strong platform type of construction may be obtained at the end portion of the car. Another object is to provide a construction whereby wood floor beams may be advantageously associated with the cast members of the underframe. Another object is to provide structural relationship between the end platform casting and the center sill whereby the center sill may be more securely attached to the end casting than has heretofore been possible.

With these and other objects in view the invention consists of the formation, combination and arrangement of parts as will be herein described and claimed.

In the drawings,

Figure 1 is a part plan view and part horizontal sectional view of one of the end castings as used with the underframe of a car constructed in accordance with the principles of the present invention. The sectional portion of this view is taken approximately on line 1—1 of Figure 2.

Figure 2 is a side elevational view of the same casting and Figure 3 a longitudinal vertical sectional view thereof taken on line 3—3 of Figure 1.

Figure 4 is a partial end elevational view of the same casting seen in the direction of arrow 4.

Figure 5 is a view partly in end elevation and partly in transverse vertical cross section, the section being taken on the line 5—5 of Figure 1.

Figures 6 and 7 are transverse vertical sections taken approximately on lines 6—6 and 7—7 respectively of Figure 1.

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

Figure 9 is a plan view of one end of a complete underframe constructed in accordance with the principles of the present invention and involving the casting shown in Figures 1 through 8.

Figure 10 is a central vertical cross section through a portion of the same, the view being taken substantially on line 10—10 of Figure 9.

Figure 11 is a vertical cross sectional view taken through the zone where the center sill is connected to the main end casting, the view being taken approximately on the line 11—11 of Figure 9.

Figure 12 is a side elevational view of one of the weld plates used for joining of the center sill and end casting.

Figures 13 and 14 are end elevational and plan views respectively of one of the end sill castings employed in the present construction.

Figure 15 is a fragmentary plan view illustrating the method of installing one of the floor beams of Figure 9.

Figure 16 is a longitudinal vertical cross section taken on line 16—16 of Figure 9 and illustrating the floor beam construction.

In these drawings, one end only of the underframe is shown, but it will be understood that both ends of the car are constructed in like manner. The car underframe consists of a pair of end castings 1 of platform construction, pairs of end sill castings 2, a longitudinal center sill 3, and a pair of longitudinal side sills 4, all being suitably joined together to form a rigid underframe. Each casting 1 embodies a main transverse or body bolster portion 5, a frontwardly extending draft portion 6, a pair of diagonal brace members 7 and a rearwardly extending center sill connecting portion 8. These various elements are all suitably united in the single integral casting 1. The body bolster portion of the casting is intended to transfer vertical loads inwardly from the sides of the car to the center plate 9 and consists of an upright web 10 with top and bottom flange plates 11 and 12. The bottom flange member 12 is suitably enlarged and arranged at 13 to constitute side bearings, and at 14, directly beneath the crossing of the center lines of the body bolster portion and the draft member portion there is fashioned in integral manner a center plate member 15.

The draft portion 6 is constructed to house the coupler and draft parts, and includes parallel spaced upright webs 16, the space between the same forming a draft gear pocket 17 for the usual draft gear. The rear of this draft gear pocket 17 is defined by draft gear buffing stops 18, these being formed in part by convoluted offsets in the webs 16, as at 16a. The main portions of these webs however are not so offset, but from the rear of the draft gear pocket are directed inwardly, or toward each other, as at 19 and 20, until at the center line of the body bolster portion they lie above and form stiff vertical supports 21 and 22 for the side edges of the center plate 15. In this manner the draft forces are well directed and the center plate is well stiffened for the concentrations of forces that occur when the car rocks from side to side.

The outermost portion of the draft member 6 is formed as a coupler pocket with a striking member 23, coupler side guides 24 and 25, and a coupler carrier portion 26. An integral draft gear guide member 27 and a detachably draft

gear carrier **28** are provided, the latter being attached to the bottom flanges of the portion **6** by means of rivets through holes **28***a*.

The center sill **3** is formed of a deep I-beam, being however reduced in depth at each end for attachment to the platform castsings **1**. The reduction in depth is effected by cutting away a long triangular section of the web and then bending the lower portion upwardly to close the cut-away space, then welding the lower portion of the web to the upper portion of the same as indicated at **38**. Construction similar to this is shown in earlier patents, as for example in Lamont, #1,031,276 and Lewis et al., #2,103,730. The present invention includes means for more securely attaching the end of such a center sill to the rear end portion **8** of the casting **1**. The end **8** of the casting **1** is especially constructed in that the vertical webs **16** are diverted toward each other at **29** and **30** at a rapid rate so that at the point where the center sill and the casting **1** are connected, these webs lie in spaced parallel fashion at **31***a* and **31***b* with just sufficient space between them to accommodate the web of the center sill and splice or weld plates **33** and **34**.

When connecting the center sill to the end of the casting **1**, the uppermost portion of the unwelded web of the center sill is first secured as by rivets **35** to the top portion of the extension **8**. The lower split portion **36** of the center sill web is then sprung or forced upwardly, preferably by pressure means such as a hydraulic press, into tight contact with the bottom portion of the extension **8**. This bottom portion of the center sill is then rigidly secured as by rivets **37** to the bottom portion of the extension **8**. The splice plates **33** and **34** should, of course, be in place, but not welded, when the lower portion of the split center sill is thus pressed up into position.

Heretofore in center sill construction of this character, the slitted webs of the sills have been rewelded before the sills are slipped on to the end castings. Castings of this character cannot be produced to accurate dimensions, nor can the center sills be manufactured to exactness. Accordingly it is necessary to allow for considerable clearance allowance at the points where the rewelded sill is to be slipped over or joined to the rough casting so that any sill will fit on to any casting, irrespective of variations in sizes. The connection is therefore usually a rather loose and insecure job, as the rigid nature of the parts makes it impossible to draw the flanges of the completed sill into tight contact with the flanges of the casting by means of the rivets. The result is that the connection is not of the necessary tightness and firmness for the heavy duties of railway draft service. Such tightness could be obtained only by accurate machining of the cooperating parts. In the present construction, accuracy is of no importance. The casting may come under or over as to dimensions, as the sill flanges can be individually drawn up into tight contact with the casting flanges in the process of assembly, irrespective of casting dimension. Thus the top portion of the sill is, as heretofore stated, firmly secured by rivets **35** to the top portion of extension **8**. This can be done by the usual hydraulic bull so that the parts are squeezed into tight riveted contact. The lower portion **36** of the sill web is then sprung upwardly and hydraulic means is employed to squeeze the bottom flange into tight contact with the lower portion of extension **8**. The bottom rivets are thus also driven in the usual hydraulic pressure manner. It will thus be seen that variations in dimensions of the cast extension **8** are of no consequence so far as fitting and riveting these parts together is concerned, each portion of the sill being squeezed independently to the extension **8** and the two web portions thereafter being welded together.

It will be seen that intimate contact and a tight fit in the vertical direction may thus be secured by so forcing the separate portions of the split center sill into contact with the top and bottom surfaces of the extension **8** if done before the web of the center sill is welded.

After the riveting is done at **37**, the welding of the center sill web is done, as at **38**.

Attention is called to weld holes **39** in the weld plates, and registering weld holes **40** in the web portions **31***a* and **31***b* of extension **8**. Through and within these holes welding is to be done first as at **41** (Figure 11) to attach the weld plates to the web of the center sill, and thereafter as at **42** to attach the webs **31***a* and **31***b* to the preceding welding. Rivets **40***a* through holes **40***b* might also be used in connecting these parts together.

Heretofore where it has been attempted to insert a center sill web into the cast opening of an end casting, the slot in the end casting has been made as nearly as possible of a size to just admit the center sill web. Web rivets have then been driven to secure the parts together. As heretofore stated, castings such as these cannot be made to any particular degree of accuracy and consequently sufficient average clearance must be allowed for to insure the free admission of the structural center sill into the minimum slot. The casting is of such a heavy nature that the usual rivet bull or hydraulic rivet press will not spring the side walls of such a casting into contact with the center sill web when the slot clearance is anything above the minimum. Consequently, where it has heretofore been attempted to so connect parts of this character, the riveting has been unsatisfactory because of the inability to obtain tight riveting. In the present construction the slot is originally made of materially greater width than the web of the sill, and weld or filler plates such as **33** and **34** are selected of such thickness that they can be driven into place to just fill up the excess slot dimensions, whatever the same may be. Accordingly, when rivets such as **40***a* and **40***b* and welding such as at **41** and **42** is done, the completely filled up slot results in a tight connection irrespective of the original size of the slot in the casting.

The stability and general merit of the aforedescribed construction whereby the center sill is secured to the casting **1** will be appreciated by those familiar with this art.

The side sills **4** extend the full length of the car and are secured by rivets **43** to suitably shaped ends of the body bolster portion of the casting **1**. These side sills extend as aforesaid all the way to the end of the car. Secured between the extending end of the draft gear portion **6** of the casting **1**, and the projecting ends of the side sills **4** are the separate cast end sill members **2**. These may be riveted to the end of the casting **1** at **44** and to the ends of the side sills at **45**.

Cars of the character with which this underframe will be used are usually supplied with wood floors made up of transverse floor planking. To support the floor, longitudinal floor beams such as **46***a*, *b*, *c*, *d* and *e* are provided. The present invention includes novel means for as-

sociating some of such floor beams with the cast platform construction.

Located between each of the end sill castings and the adjacent diagonal brace member **7** of the casting **1** is a short floor beam **46***a*. The diagonal brace member is provided with a shelf **47** upon which the end of this beam may rest and also with a flange **48** which forms a stop to prevent the sill **46***a* from shifting off the support **47**. The end sill casting is provided with a pocket **49** into which the end of sill **46***a* is entered. This sill is placed in position before the end sill casting is riveted in place, hence it is impossible for the sill **46***a* to escape from its position, once the end sill casting is secured in place.

Provision is made for the use of a short floor beam **46***b* within the triangular interval between the diagonal brace member **7** and the body bolster member **5** of the casting **1**. It will be noted that the web of the body bolster member **5** carries a floor sill pocket **50** into which the end of the floor beam may be placed. The diagonal brace member is provided on its facing edge with a shelf **51** and a stop shoulder **52** for the support and retention of the floor beam. The manner of inserting the short floor beam **46***b* into its space is shown in Figure 15. It will be seen that the sill is first entered in a misaligned position, and is then swung over into proper alignment and onto its shelf **51**. When in its true position, a bolt **53** is entered through holes in the flange **48** and the end of the sill **46***b*, thereby holding the outer end of sill **46***b* in place.

For use with flat cars where end stakes are necessary for staying the load, provision is made for the application of such stakes. A vertically disposed end stake pocket **54** is provided in each of the end sill castings **2**, these being located as near to the floor beams **46***a* as is practical. Two similar pockets **55** are provided near the outer end of the draft portion **6** of the casting **1**. It will thus be seen that the end stakes are pocketed in rigid castings, and are located at points of particular stiffness so that the underframe will not be sprung when the end stakes receive a severe blow from shifting lading. Thus both the floor beams and the side sills are availed of to provide stiffness for the bases of those end stakes which enter the pockets **54**. The entire draft portion of the casting **1**, supplemented by the strength value of the diagonal brace members **7** is utilized for staying the bases of those stakes which enter the pockets **55**.

I have thus described an embodiment of my invention. Other embodiments are contemplated, within the scope of the appended claims, without departing from the spirit of the invention.

What is claimed is:

1. The improvements in car underframes of the type wherein the main draft element of the car is constructed in a composite manner and which includes two end castings extending respectively from the ends of the car approximately to the truck centers and with a center sill member secured to the inner ends of said end castings and extending approximately from truck center to truck center, the center sill being formed of a relatively deep rolled section having top and bottom flanges and an upright web, said center sill section being fashioned into reduced depth at its ends by cutting away wedge shaped portions of the web thereof and then reducing the depth of said ends by springing the separated top and bottom flanges toward each other and subsequently rewelding the said cut web edges together, said improvements consisting of the method of joining the reduced ends of the center sill section to the end castings which involves first springing the cut and unwelded ends of the center sill section into such positions that the top and bottom flanges of the center sill member are brought into close contact with and tightly embrace suitably shaped top and bottom portions of the end castings, then rigidly securing said flanges in place to the said end castings, then rewelding the cut edges of the center sill web together, and finally securing the rewelded web of the center sill section to the end castings.

2. Improvements in a car underframe of the type involving at each end a draft casting extending from the car end sill to the body bolster and with a flanged center sill extending from draft casting to draft casting and welded to the same, said improvements consisting of a rearward extension on each of said end castings, the same having an upright center sill web-receiving slot formed therein defined laterally by spaced upright walls, said slot being of materially greater width than the thickness of the web of the center sill, apertured weld plates arranged along either side of the center sill web of a thickness complementary to that of the web to fill the said slot, registering apertures formed in the said upright walls of the draft casting extension where through welding may be applied in the apertures of the weld plates to secure the latter to the web of the center sill and wherein welding may also be applied to secure the upright walls of the draft casting to the weld plates.

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