Oct. 4, 1938. O. C. DURYEA. 2,132,233

CAST RAILWAY CAR BODY BOLSTER

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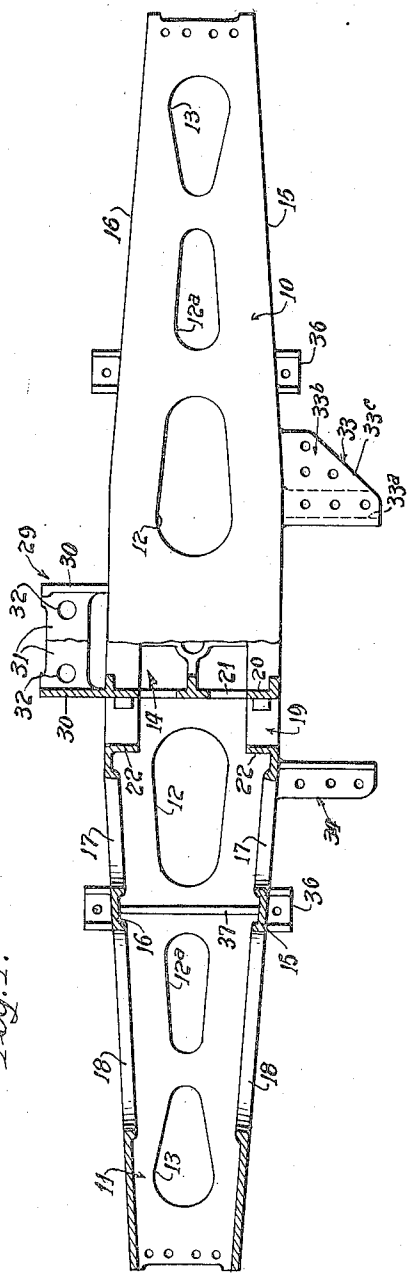

Fig. 1.

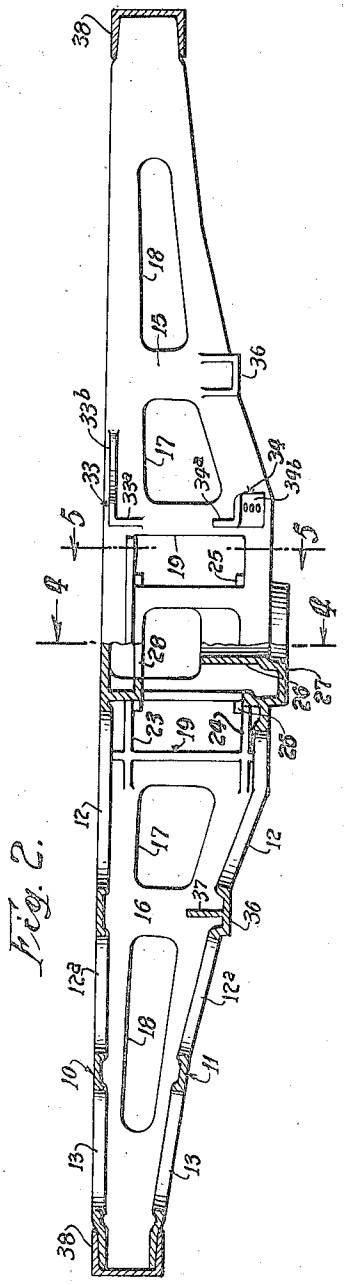

Fig. 2.

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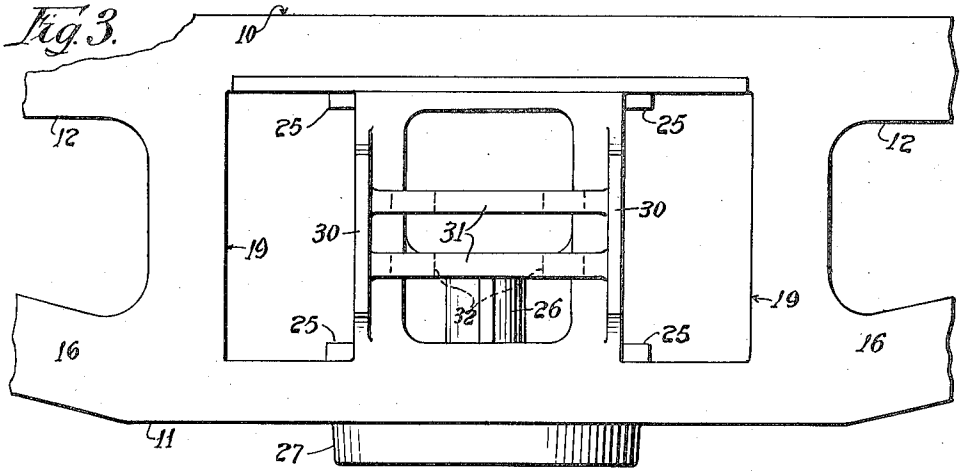
Fig. 3.



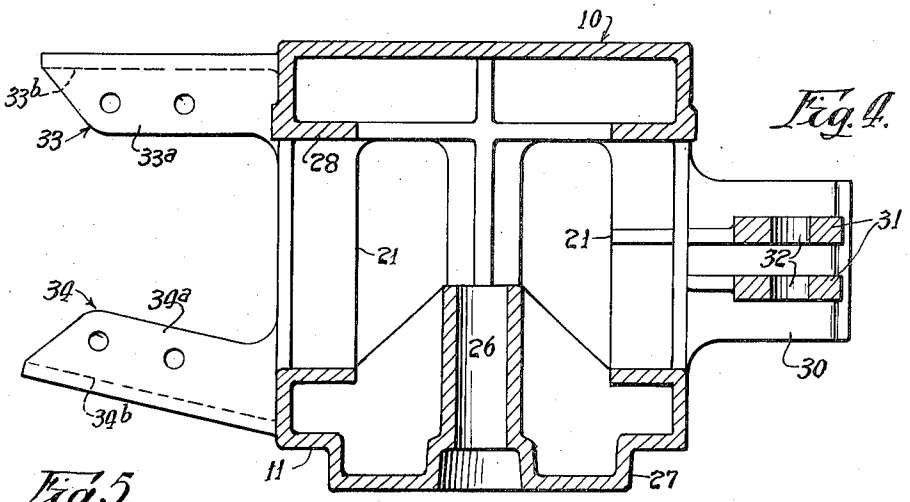


Fig. 4.

Fig. 5.

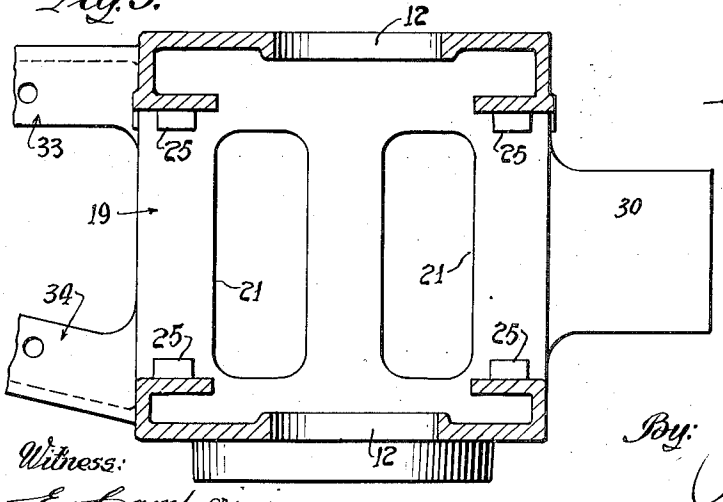
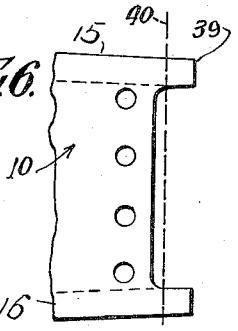


Fig. 6.



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UNITED STATES PATENT OFFICE

2,132,233

CAST RAILWAY CAR BODY BOLSTER

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Application November 2, 1936, Serial No. 108,784

13 Claims. (Cl. 105—230)

This invention relates to improvements in cast railway car body bolsters and it consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The cast railway body bolster of the present invention is especially adapted for use in the well known Duryea cushioned type of underframe. Such an underframe embodies a center member extending substantially the length of the car structure and movable relatively thereto, suitable cushion means being interposed between said center member and the body bolster of the car whereby the car and its lading are cushioned against damage, resulting from shocks or blows from draft and buffing forces applied to said center member.

To brace the body bolster against deflecting forces which might twist or rack the same, torque arms are provided between one side of the body bolster and end sill of the car. Also, diagonal bracing is provided between said side of the bolster and said end sill. Also on one side of the bolster are means for operatively connecting an associated cushion gear thereto whereby the above mentioned cushion action is made available.

Bolsters for underframes of the Duryea type have heretofore been of the built up type which necessitates the provision and attachment of extra parts for the operative connection of the cushion gear, torque arms and diagonal bracing elements.

One of the objects of the present invention is to provide a car body bolster for a Duryea type of underframe, and which bolster is cast as a unit so as to include, not only the usual sill openings but also to include integral means whereby the associated cushion gear, torque arms and diagonal bracing may be operatively attached or connected to the body bolster.

Another object of the invention is to provide a cast bolster, which may be shipped as a complete structure to its place of assembly with other coacting parts of a car underframe.

A further object of the invention is to provide a cast body bolster for a Duryea type of underframe, with the parts coordinated for a mutual bracing effect whereby the weight and cost of the bolster are reduced to a minimum.

Still another object of the invention is to provide a cast bolster of this kind wherein the ends of the diaphragms are made oversize for a trimming to fit the side sills of the underframe in which it is installed.

The above mentioned objects of the invention, as well as others, together with the several advantages thereof will more fully appear as I proceed with my specification.

In the drawings:—

Fig. 1 is a view partly in plan and partly in longitudinal horizontal section of a cast railway car body bolster embodying the preferred form of the invention.

Fig. 2 is a view in side elevation of the bolster as viewed from the torque arm side thereof, with parts shown in longitudinal vertical section.

Fig. 3 is a view in side elevation of the mid-portion of the bolster as viewed from the cushion gear side thereof.

Fig. 4 is a transverse vertical section through the mid portion of the bolster as taken on the line 4—4 of Fig. 2.

Fig. 5 is another transverse vertical section through part of the bolster as taken on the line 5—5 of Fig. 2.

Fig. 6 is a detail plan view of one end of the bolster before the diaphragm extensions have been removed in fitting the bolster to associated underframe sill parts.

Referring now in detail to that embodiment of the invention illustrated in the accompanying drawings, 10 indicates the top cover plate or tension member of the bolster 11 indicates the bottom tie plate or compression member of the bolster. The said tension and compression members are the widest and are spaced the greatest distance apart at their mid portions, and each member tapers in width outwardly from its widest mid portion. The tension member is substantially flat throughout its length, while the end portions of the compression member are inclined upward from the mid portion in the manner conventional in bolsters of this kind. In said tension and compression members, outwardly of the mid portions thereof are longitudinally spaced openings 12, 12a and 13 respectively, whereby the amount of metal going into said members may be reduced in weight without a sacrifice in strength.

Integral with the mid portion of the tension and compression members is a center brace structure indicated as a whole by the numeral 14 and outwardly from said structure toward the ends of the bolster are the shear resisting diaphragms 15 and 16 respectively, connecting the lateral margins of the compression and tension members together. In said diaphragms are longitudinally spaced openings 17 and 18 whereby weight is reduced without sacrificing strength. It is apparent from the above that the bolster is of a box-like cross section substantially at any

point throughout its length, and which section is one having the greatest strength for its weight.

The center brace structure is formed to provide longitudinally spaced sill openings 19—19 which extend transversely through the bolster. The inner sides of said openings are defined by upright walls 20 with openings 21 therein and the outer sides of said openings are defined by upright, oppositely and inwardly extending flanges 22. The top and bottom of the ends of said openings are defined by oppositely and inwardly extending horizontal flanges 23—24. At the junction of the last mentioned flanges with the upright walls 20, are sill member guide lugs 25.

In the space between the side walls of the center brace structure is a tubular king pin boss 26 which rises from a center plate 27. Said center plate is integral with the mid portion of the compression member and extends below the same as shown. The top of the space before mentioned is defined by a horizontal wall 28 having a suitable opening therein and which wall is spaced a suitable distance below the tension member 10.

Projecting from one side of the mid portion of the bolster is a means 29 whereby a part of the associated cushion gear (not shown) may be operatively connected thereto. In this instance said means comprises a pair of upright, lateral members 30—30 forming extensions of the walls 21—21. Connecting said members is a pair of vertically spaced webs 31—31 having registering openings 32 therein to receive the pins whereby the cushion gear, before mentioned, is operatively connected to the bolster.

On the opposite side of the mid portion of the bolster are longitudinally spaced pairs of top and bottom arms, 33—34 respectively, which project laterally from those portions of the center structure, outwardly of the openings 19—19. The top arms 33—33 of both pairs are disposed horizontally while the bottom arms 34—34 of both pairs extend in upwardly inclined planes.

Each arm is preferably of an angle bar cross section. In the case of the top arms 33, the vertical flanges 33*a* thereof face downwardly and the horizontal flanges 33*b* face outwardly. The last mentioned flanges have triangular extensions 33*c* to form parts to which one end of the diagonal bracing (not shown) of the associated underframe may be operatively connected. In the case of the bottom arms 34, the vertical flanges 34*a* face upwardly and the horizontal flanges 34*b* face outwardly.

Those parts of the compression member, in the planes between the openings 17 and 18 of the diaphragms are formed to provide flat side bearing plates 36 and between said diaphragms in the planes of said plates are stiffening ribs 37.

The bolster, of course, is intended for assembly in an underframe which includes side sills 38 appearing in Fig. 2. In the casting of the bolsters, shrinkage in the various bolsters will vary, due to the differences in temperature of the molten metal at the time of pouring the respective castings. Thus, because of the uneven shrinkage, certain bolsters will be oversize and will require trimming at the ends to make them fit the sills of any associated underframe within reason. So that this trimming may be accurately carried out, inexpensively as with a chipping hammer or other hand tool, I make the ends of the diaphragms extend outwardly beyond the ends of the associated compression and tension members, as shown in Fig. 6 at 39. In this way an excess of metal is afforded for chipping or otherwise cutting away to an extent indicated by the dotted lines 40 in Fig. 6 to fit the particular sill involved. Furthermore, it is not necessary to machine or cut the material of the compression and tension members which greatly simplifies and speeds the fitting operation.

As shown in Fig. 2, this sill is in the form of a channel 38 with the flanges thereof fitted upon the top and bottom parts of the ends of said tension and compression members respectively. These parts of said members are depressed to provide a substantially flush arrangement between the top of the sill and the tension member respectively for the flooring of the particular car being made.

Because of the construction described, a cast integral railway car body bolster for a Duryea type of underframe is possible and which includes the cushion gear connection means, the torque arm attaching means and the diagonal bracing attaching means. In making the diagonal bracing attaching means as extensions of the part of the torque arm attaching means, the vertical flanges 33*a* of the arm 33 also function as stiffening elements for said bracing attaching means.

The bolster described has its parts so formed and correlated as to provide a mutually advantageous bracing effect upon one another. Therefore, the bolster may be substantially reduced in weight without affecting its strength. When it arrives at the place of its assembly in an underframe, it is only necessary to remove such portions of the diaphragm ends as will make the same fit the underframe, as all parts for connection with other associated parts are present on the bolster.

While in describing the invention, I have referred in detail to the form, arrangement and construction of the parts thereof, the same is to be considered only in its illustrative form so that I do not wish to be limited thereto except as may be particularly set forth in the appended claims.

I claim as my invention:

1. A railway car body bolster for a Duryea type of underframe comprising an integral casting embodying therein a compression member and a tension member, a center brace structure between the mid portions of said members and formed to provide sill openings which extend transversely through the bolster, shear resisting diaphragms between those parts of said compression and tension members respectively outwardly of the center brace structure, and torsion arm attachment means integral with a part of the bolster and comprising pairs of top and bottom arms projecting laterally from one side of said bolster part with a pair of such arms adjacent one side of each sill opening.

2. A railway car body bolster for a Duryea type of underframe comprising an integral casting embodying therein a compression member and a tension member, a center brace structure between the mid portions of said members and formed to provide sill openings which extend transversely through the bolster, and each of which openings has inner and outer sides, shear resisting diaphragms between the lateral margins of the compression and tension members respectively, outwardly of the center brace structure and a torsion arm attachment member pro-

jecting laterally from certain of the shear resisting diaphragms adjacent the outer side of each sill opening.

3. A railway car body bolster for a Duryea type of underframe comprising an integral casting embodying therein a compression member and a tension member, a center brace structure between the mid portions of said members and formed to provide sill openings which extend transversely through the bolster, and each of which openings has inner and outer sides, shear resisting diaphragms between the lateral margins of the compression and tension members respectively, outwardly of the center brace structure, and a pair of top and bottom torsion arm attachment members projecting laterally from certain of the shear resisting diaphragms adjacent the outer side of each sill opening.

4. A railway car body bolster for a Duryea type of underframe comprising an integral casting embodying therein a compression member and a tension member, a center brace structure between the mid portions of said members and formed to provide sill openings which extend transversely through the bolster, shear resisting diaphragms between those parts of the compression and tension members respectively outwardly of the center brace structure, a torsion arm attachment member integral with a part of the bolster and projecting laterally from one side thereof adjacent one side of each sill opening and means providing diagonal brace attaching members projecting laterally from the last mentioned side of the bolster.

5. A railway car body bolster for a Duryea type of underframe comprising an integral casting embodying therein a compression member and a tension member, a center brace structure between the mid portions of said members and formed to provide sill openings which extend transversely through the bolster, shear resisting diaphragms between those parts of the compression and tension members respectively outwardly of the center brace structure, a pair of top and bottom torsion arm attachment members projecting laterally from one side of certain parts of the bolster, adjacent one side of each sill opening, each top torsion arm attachment member being formed to provide a diagonal brace attaching portion.

6. A railway car body bolster for a Duryea type of underframe comprising an integral casting embodying therein a compression member and a tension member, a center brace structure between the mid portions of said members and formed to provide sill openings which extend transversely through the bolster, and each of which openings have inner and outer sides, shear resisting diaphragms between the lateral margins of the compression and tension members respectively, outwardly of the center brace structure, and a torsion arm attachment member projecting laterally from certain of the shear resisting diaphragms adjacent the outer side of each sill opening, said torsion arm attachment member having an angle bar cross section.

7. A railway car body bolster for a Duryea type of underframe comprising an integral casting embodying therein a compression member, a tension member, a center brace structure between the mid portions of said members and formed to provide sill openings which extend transversely through the bolster, shear resisting diaphragms between those parts of the compression and tension members respectively outwardly of the center brace structure, and means integral with and projecting laterally from one side of the bolster at a point between the sill openings and adapted for the operative connection of a cushion gear thereto.

8. A railway car body bolster for a Duryea type of underframe comprising an integral casting embodying therein a compression member, a tension member, a center brace structure between the mid portions of said members and formed to provide sill openings which extend transversely through the bolster, shear resisting diaphragms between those parts of the compression and tension members respectively outwardly of the center brace structure, and means integral with and projecting laterally from one side of the center brace structure of the bolster for the operative connection of a cushion gear thereto.

9. A railway car body bolster for a Duryea type of underframe comprising an integral casting embodying therein a compression member, a tension member, a center brace structure between the mid portions of the said members and formed to provide spaced sill openings which extend transversely through the bolster and each having inner and outer sides and a top and a bottom, and means projecting laterally from the center brace structure in substantially the planes of the inner sides of the said openings and adapted for the operative connection of a cushion gear thereto.

10. A railway car body bolster for a Duryea type of underframe comprising an integral casting embodying therein a compression member, a tension member, a center brace structure between the mid portions of the said members and formed to provide spaced sill openings which extend transversely through the bolster and each having inner and outer sides and a top and a bottom, longitudinally spaced lateral projections on the center brace structure in substantially the plane of the inner sides of said openings, and means connecting said projections and adapted for the operative connection of a cushion gear thereto.

11. A railway car body bolster for a Duryea type of underframe comprising an integral casting embodying therein a compression member, a tension member, a center brace structure between the mid portions of said members and formed to provide sill openings which extend transversely through the bolster, shear resisting diaphragms between those parts of said compression and tension members respectively outwardly of the center brace structure, at least one torsion arm attachment member integral with a part of the bolster and projecting laterally from one side thereof adjacent each sill opening, and means integral with and projecting laterally from the other side of the bolster at the center brace structure thereof and adapted for the operative connection of a cushion gear thereto.

12. A railway car body bolster for a Duryea type of underframe comprising an integral casting embodying therein a compression member, a tension member, a center brace structure between the mid portions of said members and formed to provide sill openings which extend transversely through the bolster, shear resisting diaphragms between those parts of said compression and tension members respectively outwardly of the center brace structure, means integral with and projecting laterally from one side of the bolster outwardly of each of said sill openings therein adapted for the attachment of torsion arms

thereto, and means integral with and projecting laterally from the other side of the bolster between said sill openings and adapted for the operative connection of a cushion gear thereto.

13. A railway car body bolster for a Duryea type of underframe comprising an integral casting embodying therein a compression member, a tension member, a center brace structure between the mid portions of said members and formed to provide sill openings which extend transversely through the bolster, shear resisting diaphragms between those parts of said compression and tension members respectively outwardly of the center brace structure, a pair of top and bottom integral arms projecting laterally from one side of the bolster outside the top and bottom ends of each sill opening therein, and means integral with and projecting laterally from the other side of the bolster between said sill openings and adapted for the operative connection of a cushion gear thereto.

OTHO C. DURYEA.