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Neumann et al.

[11] **3,837,293**

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[54] **RAILWAY TRUCK BOLSTER AND SIDE FRAME**

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[73] Assignee: **Amsted Industries Incorporated,** Chicago, Ill.

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[52] **U.S. Cl.**..... **105/197 DB,** 105/202, 105/206 R, 105/226

[51] **Int. Cl.** **B61f 5/06,** B61f 5/12, F16f 1/06

[58] **Field of Search** ..... 105/197 DB, 202, 206 R, 105/226

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Primary Examiner—M. Henson Wood, Jr.
Assistant Examiner—Howard Beltran

[57] **ABSTRACT**

A railway truck wherein a bolster is supported in the windows by a pair of side frames and said bolster has a U-shaped stiffening member raised above the bolster top wall on each end thereof, said member extending from side to side intermediate friction shoe pockets defined by said bolster. The compresssion member of said side frame defines a downwardly opening U-shaped channel capable of receiving therein said U-shaped stiffening member of the bolster in a telescoping relationship. The arrangement provides for greater length of both the control spring columns and load spring columns.

4 Claims, 10 Drawing Figures

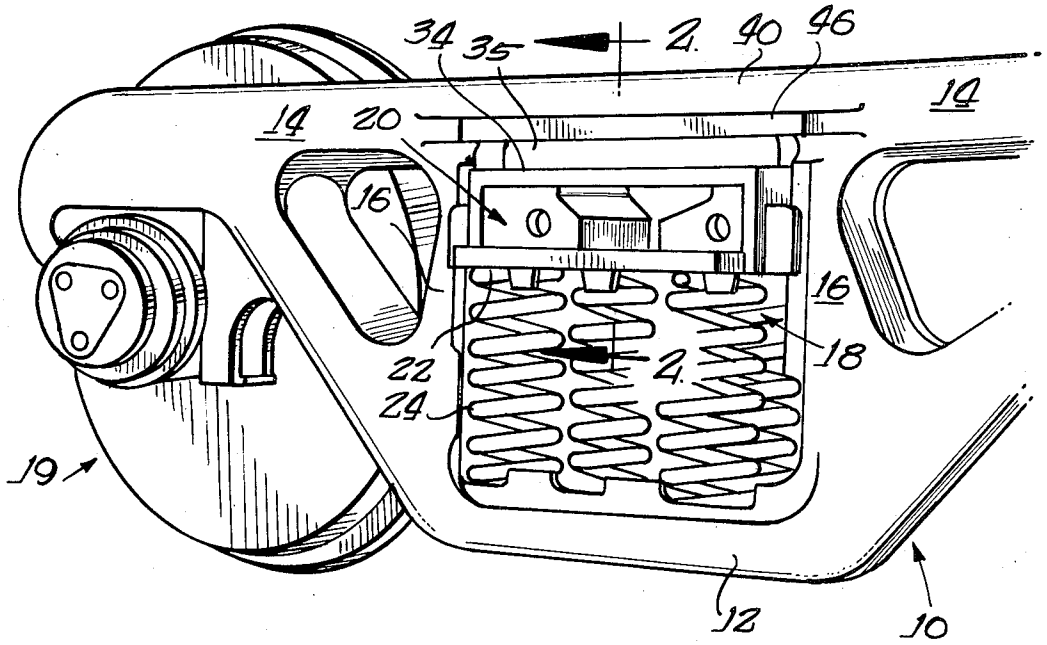

Fig. 1.

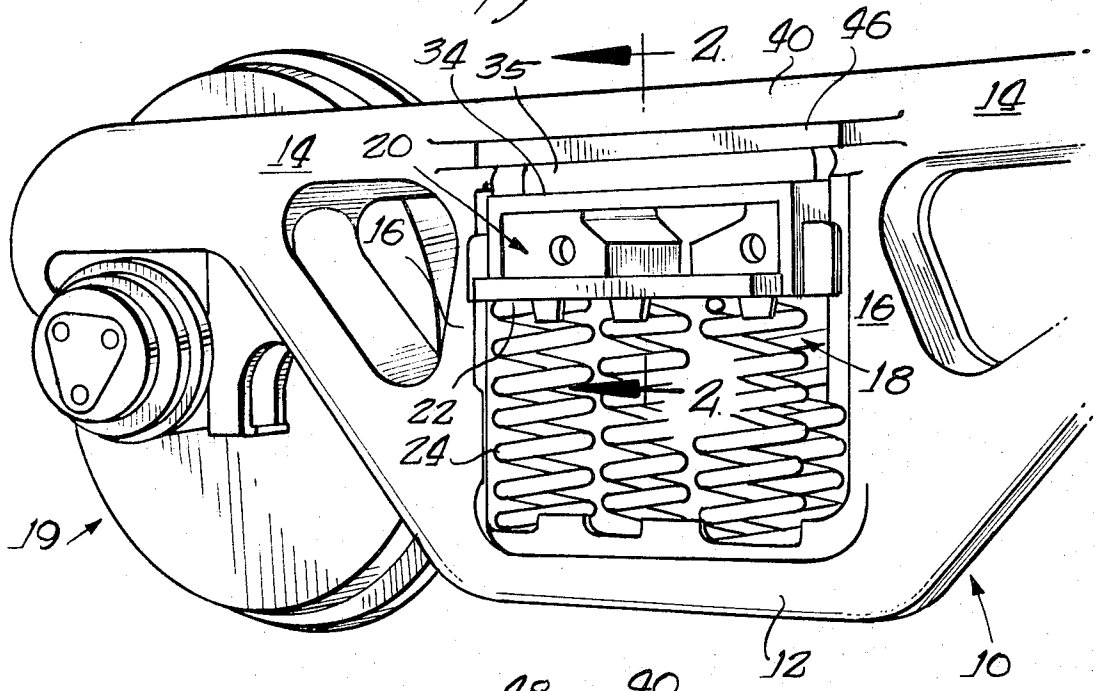
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Fig. 2.

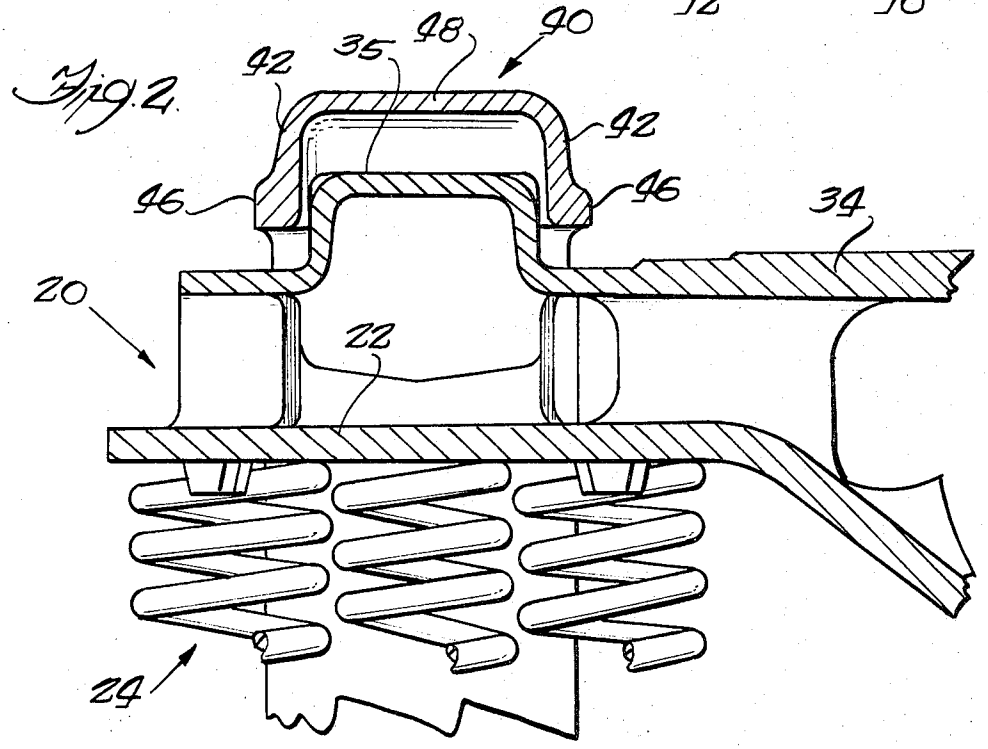
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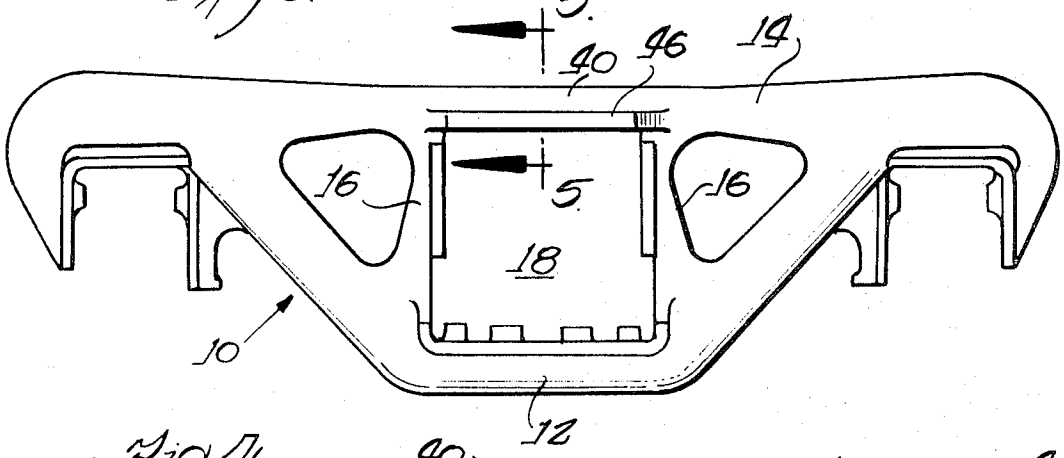
Fig. 3.



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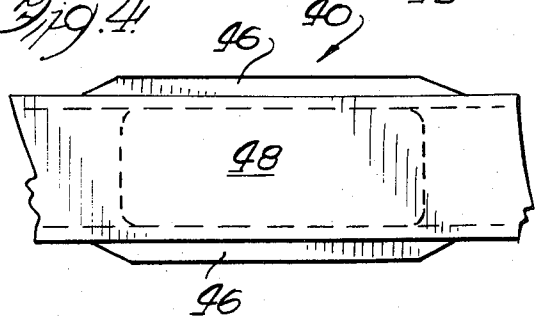


Fig. 5.

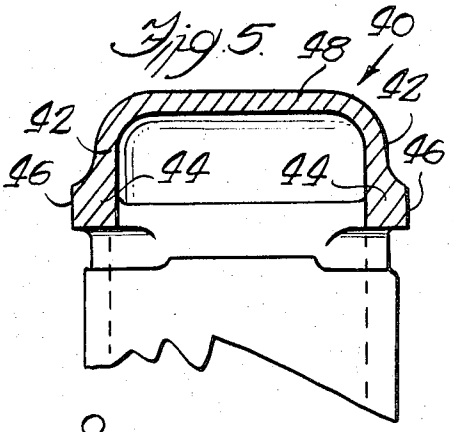


Fig. 6.

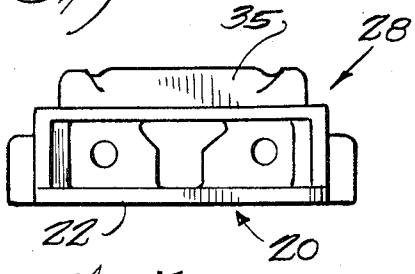


Fig. 8.

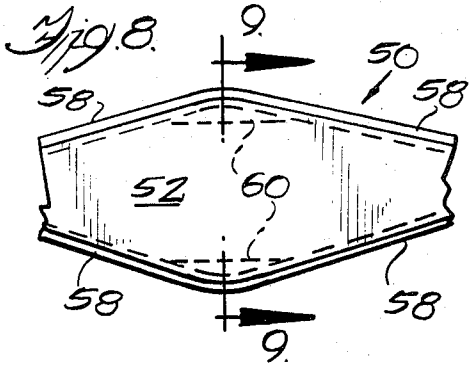


Fig. 7.

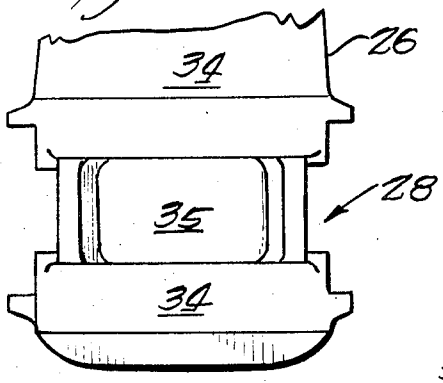
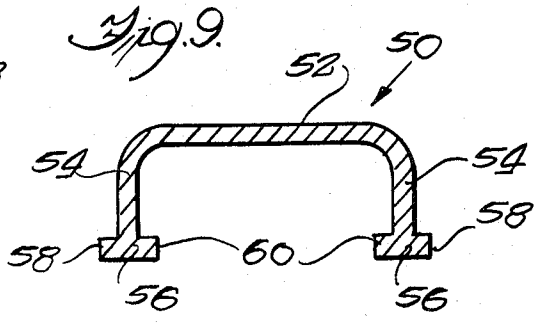


Fig. 9.



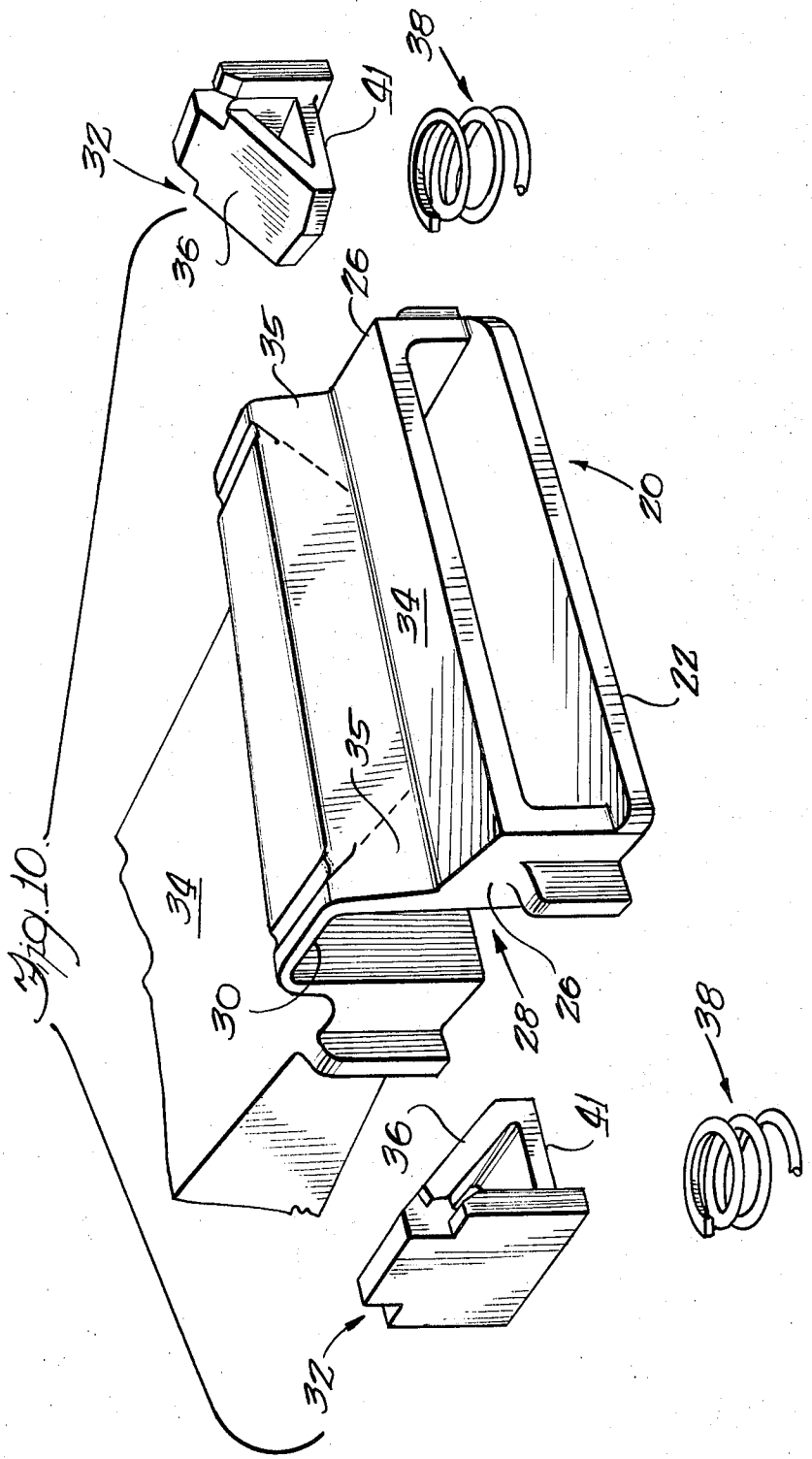


Fig. 10

RAILWAY TRUCK BOLSTER AND SIDE FRAME

This invention relates to railway vehicles and more particularly to improvements in cast steel truck bolsters and side frames.

With the advent of larger railway vehicles and heavier loading, the need has arisen to structurally improve certain parts of the car truck that are subject to high stresses during actual service conditions.

Hoowever, it is imperative that any improvements advanced to structurally improve components of the railway car truck also exhibit satisfactory ride characteristics. As the capacity of railway vehicles increased, it has become increasingly more difficult to maintain the required ride characteristics merely because of the increased load range. This is due to the fact that a given load for a railway car under service conditions may range from a capacity load to near empty car conditions.

Accordingly, an object of this invention is to provide an improved railway truck with considerably improved strength qualities that is capable of withstanding severe dynamic service loading while at the same time providing improved ride characteristics over a continuous range of car loads.

Other objects will become apparent from the following description and appended claims, taken in conjunction with the accompanying drawings wherein:

FIG. **1** is a fragmentary perspective view of a freight car truck embodying a preferred form of the invention, the view being taken from one outboard end of the bolster;

FIG. **2** is a partial sectional view taken in the transverse vertical plane indicated by the line **2—2** of FIG. **1**;

FIG. **3** is an outboard side elevational view of a railway car truck side frame;

FIG. **4** represents a top plan view of a portion of the compression member of the side frame shown in FIG. **3**;

FIG. **5** is a further fragmentary sectional view taken in the vertical transverse plane indicated by the line **5—5** of FIG. **3** which passes through the compression member of the side frame;

FIG. **6** is a side elevation of one end of the bolster;

FIG. **7** is a top plan view showing one end of the bolster structure;

FIG. **8** is a top plan view representing another embodiment of the compression member of the side frame;

FIG. **9** is a sectional view taken in the vertical transverse plane indicated by the line **9—9** of FIG. **8** which passes through the compression member of the side frame; and

FIG. **10** is an exploded perspective view of the truck bolster, friction shoes and control springs showing more clearly the improved construction.

Referring first to FIG. **1** which illustrates a portion of a truss type railway truck, the side frame indicated generally at **10** is seen to comprise a tension member **12** and a compression member **14** interconnected by spaced vertical colums **16,** the sides of which form a window **18** (FIGS. **1** and **3**) substantially rectangular in shape. The side frame **10** is supported in the usual manner by wheel and axle assemblies **19,** a portion of which can be seen in FIG. **1.**

It should be understood that the railway truck for the purpose of the present disclosure may be considered identical at both sides thereof, and for the sake of brevity only that portion shown will be described in detail.

The window **18** is adapted to receive the end of the bolster, generally indicated at **20.** The lower surface **22** at the end of the bolster **20** is supported by a plurality of support spring groups **24** which rest at their lower ends on the side frame tension member **12.** In opposite side walls **26** at each end of the bolster **20** are wedge-shaped receiving pockets **28** which open outwardly toward the side frame columns **16** and have an inclined inner wall or sloped surface **30** which has a width corresponding substantially to the width of the wedge-shaped friction shoe **32** positioned therein.

The inclined inner wall **30** (FIG. **10**) that projects from each pocket above the top wall **34** of the bolster **20** is connected by an integrally cast hood or stiffener **35** which extends across the width of the top wall **34.** The improved construction of the bolster **20** greatly increases the strength of the inclined or sloped surface **30** in the bolster pocket **28.**

The use of the arrangement hereinbefore described provides the stiffening required to insure the maximum projection of the sloped surfaces **30** of the bolster **20.** This U-shaped stiffener **35** provides direct support between opposing sloped surfaces **30** and eliminates any tendency for the sloped surfaces to break off and pivot toward each other around the line of intersection formed by the bolster top wall **34** and the sloped surfaces **30.**

One wedge-shaped friction shoe **32** is operatively carried in each pocket **28** and defines an inclined surface **36** corresponding to and frictionally engaging the inclined wall or sloped surface **30** of the pocket **28.** The lower surface **41** of the wedge-shaped friction shoe **32** is engaged by the upper end of a control spring **38** which is disposed between said friction shoe **32** and the tension member **12** of the side frame **10.** The inclined inner wall **30** therefore provides an inclined thrust area equal to that of the engaged portion of the inclined surface **36** of the wedge-shaped friction shoe **32.**

In the past such an arrangement could not have been utilized because of the additional height requirements needed to accommodate the U-shaped stiffener **35** when the end of the bolster **20** is positioned in the side frame window **18.** Any attempt to use the arrangement would result in substantially increasing the height of the side frame which in turn results in prohibitive adjustments in car height and coupler height, both of which must remain within established ranges. Alternatively one would have to reduce the height of the springs which support the bolster, thereby insuring clearance for the U-shaped stiffener **30.** However, such an adjustment in spring height is undesirable inasmuch as it requires an increase in the spring rate, which in turn increases the stiffness of the suspension, resulting in a harsher rebound requiring additional snubbing action. Also such a stiff suspension would result in an extremely rough ride under light car conditions.

The aforementioned problems having been overcome by improved construction of the compression member **14** of the side frame **10** to allow the U-shaped stiffener **35** to be received by the compression member **14** in a telescoping manner. Such an arrangement does

not require any change in the height of the side frame, nor does it require the shortening of the springs.

The improved compression member **14** is downwardly opening U-shaped channel **40,** as best seen in FIG. **5,** devoid of tie straps and open on the underside thereof, said opening being defined by parallel bifurcated side portions **42** that extend along the underside of the compression member intermediate the vertical columns **16** of the side frame **10.**

Formed on each of the bifurcated side portions **42** is a flange **44** having external extensions **46.** The flange **44** has greater thickness than either of the side portions **42** of the top wall **48** of the U-shaped channel **40.** The thickness and shape of the flange **44** are determined by the load necessary to produce crippling of the compression member; the greater the load the thicker the flange **44.** However, it is important to maintain adequate spacing between the flanges **44** to insure the unimpeded motion of the bolster stiffener **35** therebetween.

Such as arrangement of bolster **20** and side frame **10** allows for the maximum projection of the sloped surfaces **30** which enables the friction shoe **32** to be positioned higher in the pocket **28** of the bolster **20.**

Thus it can be seen that the abovementioned arrangement enables the entire raised portion of the bolster stiffener **35** to be received in a complementary opening in the side frame **10** compression member **14,** thereby allowing maximum elevation of the bolster **20** in the side frame opening **18** which is required for insertion of long travel spring groups **24** with the minimum side frame opening **18.** Maximum projection of the sloped surfaces **30** is also provided, thereby enabling each friction shoe **32** to be positioned higher in the bolster pockets **28** which in turn substantially increases the length of the control springs **38** associated with each of the friction shoes **32.**

The resulting increased length of both the support springs **24** and control springs **38** results in a softer load rate for the springs; which insures increased reserve capacity without approaching the stress limitations of the springs. Increased spring length also means greater reserve spring travel which reduces the danger of damage to the springs and cargo by more effectively resisting a solid condition of the springs.

FIGS. **8** and **9** illustrate another embodiment of the invention wherein the compression member **14** of the side frame **10** is flared in the mid portion. That portion of the compression member **14** between the vertical columns is a flared U-shaped channel **50** opening downwardly. The flared U-shaped channel **50** has a top wall **52** and bifurcated side portions **54** all having substantially the same thickness. Extending from each of the side portions **54** intermediate the spaced vertical columns **16** are flanges **56.** The flanges **56** have an external extension **58** extending the full length of the side portions **54.** The flanges **56** in the mid portion of the flared U-shaped channel **50** have an internal extension **60.** The presence of internal **60** and external **58** extension in the mid portion of the flared U-shaped channel **50** offers greater resistance to crippling at the mid portion of the flared U-shaped channel; that portion being subject to the maximum deflection. The distance between the two internal extensions **60** is greater than the width of the stiffener **35** on the bolster **20,** thereby allowing the stiffener **35** to move freely inside the flared U-shaped channel **50** of compression member **14.** The internal extension **60** of the flange **56** blends into the side portion **54** near the ends of the flared U-shaped channel **50.**

The terms and expressions which have been employed are used as terms of description and not of limitation, and there is no intention, in the use of such terms and expressions, of excluding any equivalents of the features shown and described or portions thereof, but recognize that various modifications are possible within the scope of the invention claimed.

We claim:

1. A railway truck side frame comprising a horizontally disposed compression and tension members connected by a pair of spaced vertical columns defining an opening therebetween, said compression member defining a downwardly opening channel intermediate said spaced columns, said channel having downwardly depending legs along the edges thereof forming a generally downwardly opening U-shaped cross-section, the mid-portion of said channel being flared outwardly from said spaced columns so that said U-shaped channel has a greater width in its mid-portion than the end portions at said columns, and a flange extending along the lower extremity of each of said legs.

2. A railway car truck side frame according to claim **1** wherein said flange extends into said opening.

3. In a railway car truck, the combination comprising a side frame having compression and tension members connected by a pair of spaced columns and defining an opening therebetween, said compression member being bifurcated and having downwardly depending side portions on the underside thereof defining a downwardly opening channel intermediate said columns, said side portions being relatively closely spaced from each other at the extremities of said channel adjacent said columns, and said side portions being relatively widely spaced from each other at the mid-portion of said channel; and a bolster supported by said side frame intermediate said columns and having upper and lower walls connected by spaced side walls, said bolster defining friction shoe receiving pockets on opposite sides thereof and stiffening means extending across said upper wall and engaging said pockets, said stiffening means being receivable by said channel.

4. In a railway car truck, the combination comprising a side frame having upper and lower members spanning a pair of spaced columns defining a window, said upper member defining a downwardly opening channel wider at its mid-portion that at its extremities at said columns, a bolster supported by said side frame intermediate said members, said bolster defining friction shoe receiving pockets on opposite sides thereof, and stiffening means extending across said bolster and engaging said pockets above its upper wall, said stiffening means being receivable in said channel.

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