March 31, 1942. E. J. MAATMAN 2,278,012

CAR TRUCK

Filed Oct. 2, 1939 2 Sheets-Sheet 1

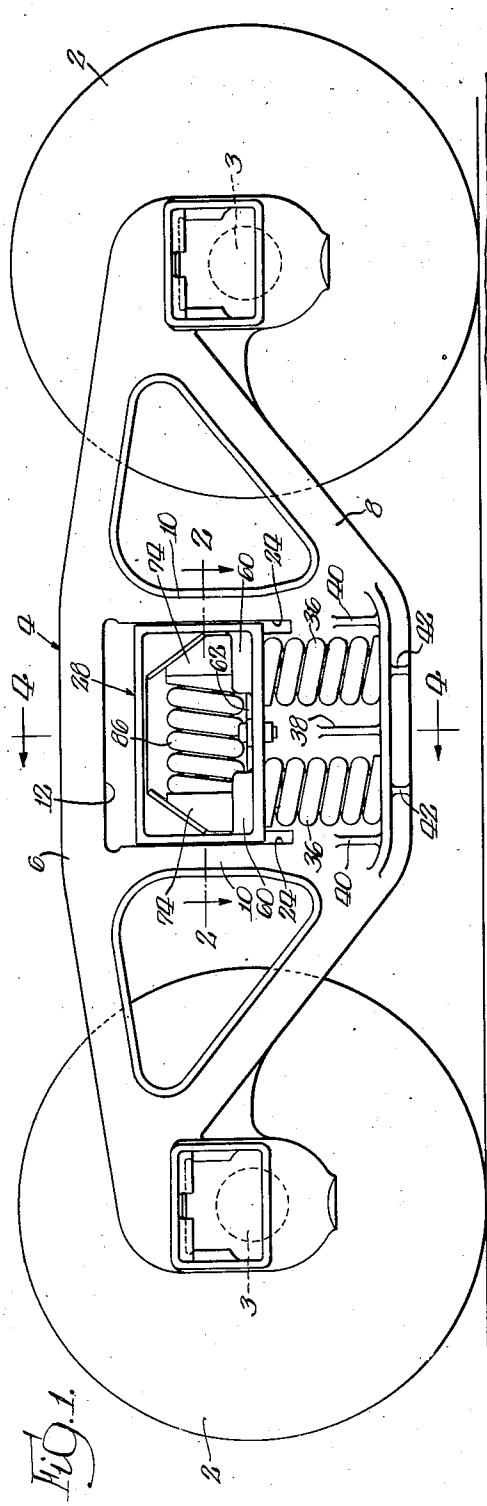


Fig. 1.

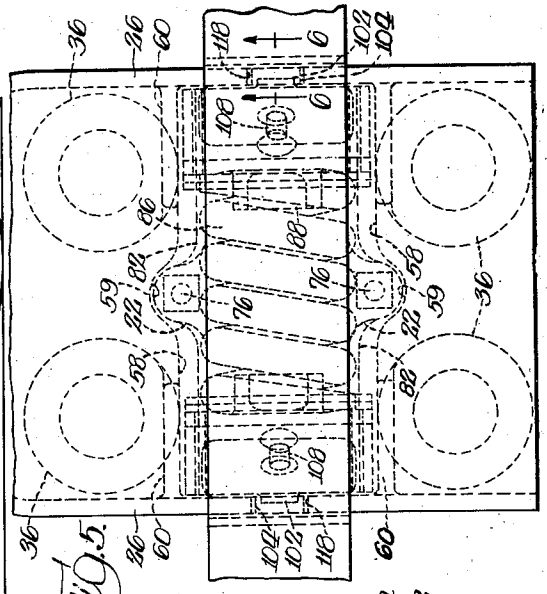


Fig. 5.

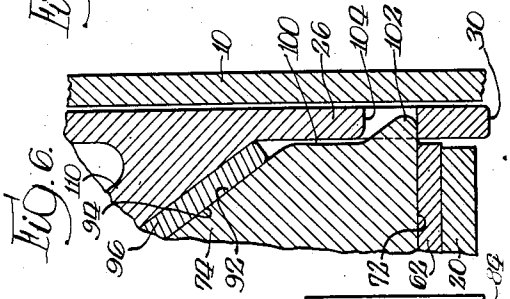


Fig. 6.

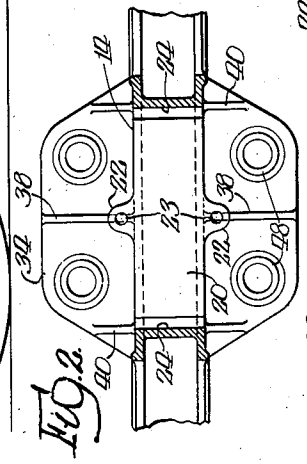


Fig. 2.

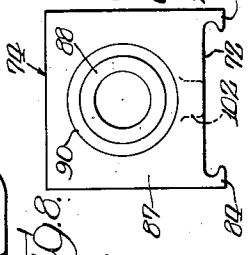


Fig. 8.

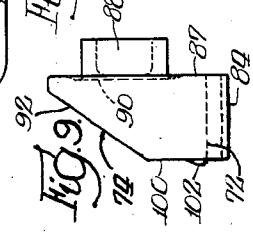


Fig. 9.

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CAR TRUCK

Filed Oct. 2, 1939 2 Sheets-Sheet 2

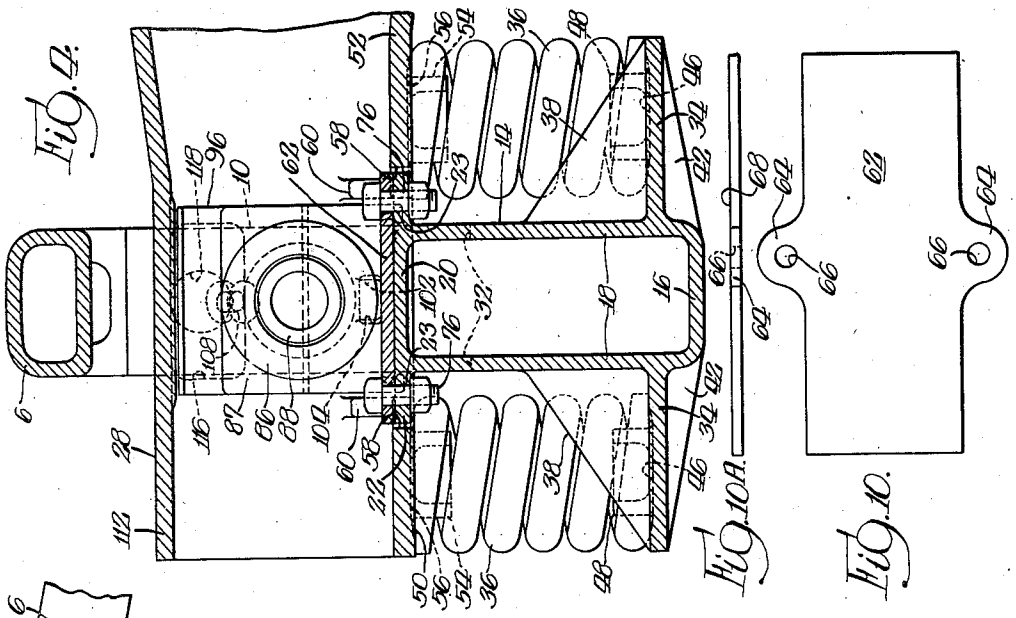


Fig. 4.

Fig. 10A.

Fig. 10.

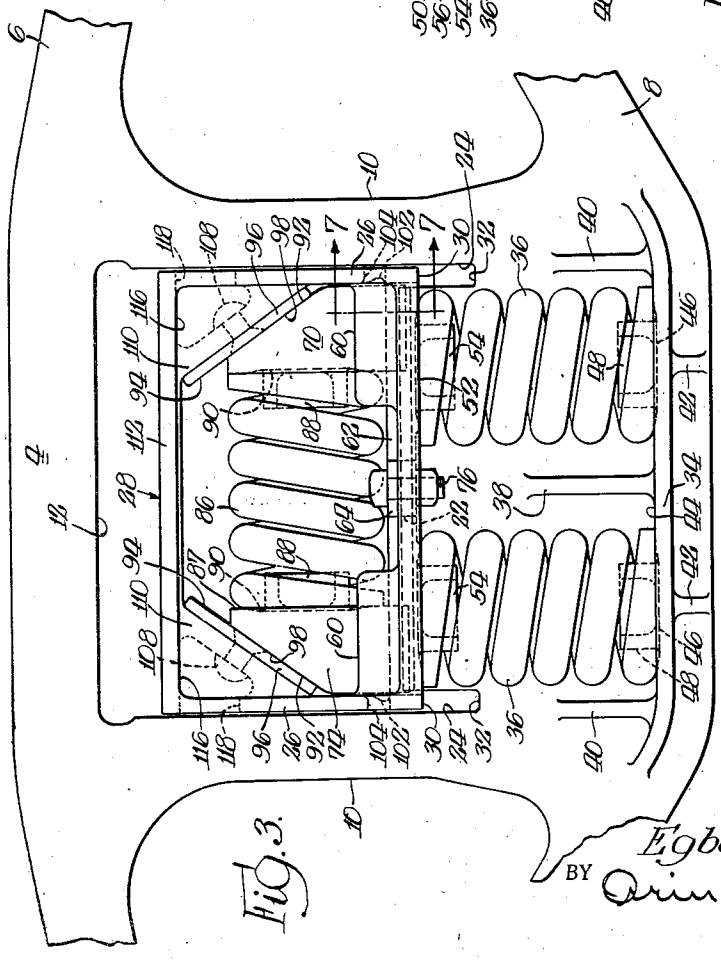


Fig. 3.

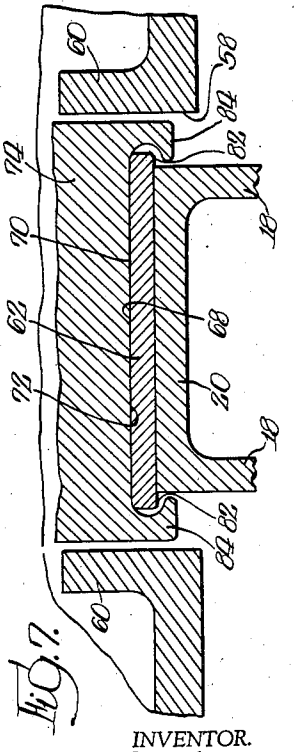


Fig. 7.

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Patented Mar. 31, 1942 2,278,012

UNITED STATES PATENT OFFICE

2,278,012

CAR TRUCK

Egbert J. Maatman, Chicago, Ill., assignor to American Steel Foundries, Chicago, Ill., a corporation of New Jersey

Application October 2, 1939, Serial No. 297,456

23 Claims. (Cl. 105—197)

My invention relates to car trucks, and more particularly to a car truck of the quick wheel change type having housed within the bolster chamber a friction absorbing device for the prevention of undue vertical oscillation of bolster springs.

An object of my invention is to provide a friction absorbing device of simple means and construction for damping vertical oscillations of the bolster springs.

Another object of my invention is to provide a friction absorbing device which has augmenting capacity to resist downward movement of the bolster in cooperation with the bolster springs.

Another object is to provide a friction absorbing device to act as snubbing means for the recoil of the bolster springs.

A further object of my invention is to provide a friction absorbing device which is of compact form and may be readily assembled and secured within the bolster before the bolster is placed in the side frame.

A still further object is to provide means whereby the side frame may be easily and quickly slipped off the bolster end without dismantling the friction device, thus permitting a quick wheel change.

Yet another object of my invention is to provide a novel method of connecting the bolster with the side frame.

Referring to the drawings, Figure 1 is a side elevation of a car truck embodying my invention.

Figure 2 is a fragmentary plan view, partly in section, with the bolster and friction unit removed, the section being taken along the line 2—2 as indicated in Figure 1.

Figure 3 is an enlarged fragmentary side elevation showing my device in more detail.

Figure 4 is an enlarged view in section through the vertical plane bisecting the truck transversely as indicated by the line 4—4 in Figure 1.

Figure 5 is a fragmentary top plan view of the side frame and bolster connection.

Figure 6 is a sectional view taken along the line 6—6 in Figure 5.

Figure 7 is a sectional view, the section being taken along the line 7—7 as indicated in Figure 3.

Figure 8 is an end view of my friction shoe; and

Figure 9 is a side elevation thereof taken from the left as seen in Figure 8.

Figure 10 is a plan view of my wear plate; and

Figure 10A is a side elevation thereof.

Describing the drawings in more detail, the wheel and axle assemblies generally indicated as at 2, 2 are of a type in common usage and through the journal connections at 3, 3 support a side frame 4 having a compression member 6, a tension member 8 and bolster guide columns 10, 10 defining the bolster opening 12. Integrally formed with and connecting the bolster columns immediately below the bolster opening 12 is the bridge wall or girder 14 having a bottom wall 16, side walls 18, 18, and a top wall 20 with horizontally projecting lugs or ears 22, 22 perforated at 23, 23. Adjacent the bolster guide columns 10, 10, the bridge wall or girder 14 may be slotted or grooved as at 24, 24 to receive the side walls 26, 26 of the bolster 28 as the bolster moves downwardly under load, and sufficient clearance is allowed so that the bottom faces 30, 30 of the side walls will clear the bottom surfaces 32, 32 of the said slots under maximum loading conditions.

The seat 34 which supports the bolster springs 36, 36 may be of any desired shape, shown here as substantially hexagonal, having central reinforcing ribs 38, 38 and other reinforcing ribs 40, 40 adjacent the bolster columns, as well as spaced transverse reinforcing ribs 42, 42 on its under face. The upper surface 44 of the spring shelf 34 may be relieved as at 46, 46 to provide accurate seating for bolster springs 36, 36 positioned by means of annular flanges 48, 48 formed thereon. On the lower surface 50 of the bottom wall 52 of the bolster are formed annular flanges 54, 54 which serve as positioning means for the upper ends of the bolster springs 36, 36, said surface being similarly arcuately relieved as at 56 to provide accurate seating of the bolster springs. The bottom wall 52 of the bolster 28 has an aperture or opening 58 contoured as at 59 to the top plate 20 of the bridge 14 so that the said bridge may be received therein. The upwardly projecting and inwardly extending flanges 60, 60 on the bottom wall of the bolster may be formed adjacent the aperture 58 to limit lateral motion of the bolster.

Seated on the upper surface of the top wall 20 of the bridge or girder 14 is the wear plate 62 of substantially rectangular shape having ears or lugs 64, 64 and bolt holes 66, 66 therein in alignment with holes 23, 23 in the lugs 22, 22. The friction surface 68 (Figure 7) of the wear plate 62 engages as at 70 with the friction surfaces 72, 72 of the shoes or wedges 74, 74 and said wear plate may be secured to said top wall 20 by means of bolts 76, 76 extending through the aligned bolt holes 66, 66 and 23, 23. On each side of the lugs 22, 22 of the bridge wall 14, the wear plate 62 projects slightly beyond the side

walls 18, 18 of said bridge as at 82, 82 to afford engagement with the bent-over flanges 84, 84 of the friction shoes 74, 74, as is best shown in Figure 7, and thus retaining said shoes in position. Resilient means are interposed between the friction shoes 74, 74 (shown here as a coil spring 86), the said spring being positioned on the inner faces 87, 87 of said shoes by means of annular flanges 88, 88 relieved at 90, 90 to provide accurate seating. The resilient member 86 urges the friction shoes 74, 74 outwardly, causing the diagonal friction surfaces 92, 92 of said shoes to engage with the friction surfaces 94, 94 of the chafing plates 96, 96 as at 98 (Figure 3). Formed on the outer surfaces 100, 100 of said friction shoes may be the lugs 102, 102 which project outwardly into slots 104, 104 in the bolster side walls 26, 26 as is best shown in Figure 8, thus providing interlocking means for holding the device in assembled relationship within the bolster chamber.

The chafing plates 96, 96 may be of rectangular shape and may be secured by means of rivets 108, 108 to the diagonal walls 110, 110 of the bolster. Said walls 110, 110 are integrally formed with the top wall 112 and the side walls 26, 26 of the bolster thus forming hollow chambers 116, 116. Access to the rivets 108, 108 is afforded through circular openings 118, 118.

To assemble my device the friction shoes 74, 74 are slid over the opposite ends of the wear plate 62 in such manner that the bent-over flanges 84, 84 slidably engage the wear plate 62. At the same time, a resilient member may be placed between the shoes and positioned on the annular flanges on the inner faces of said shoes. The friction unit as thus assembled is pushed up into the bolster chamber through the opening in the bottom wall of the bolster until the lugs 102 on the friction shoes interlock with the openings in the side walls of the bolster so that the friction unit is held in assembled relationship within the bolster. The bolster springs may then be placed on the side frame, the bolster inserted into the bolster opening and placed so that the bolt holes in the wear plate of the friction device are aligned with the holes in the flange on the top plate of the bridge or girder. The friction device is then secured to the bridge of the side frame by means of a nut and bolt assembly.

In operation, as the bolster moves downwardly, the chafing plates within the bolster frictionally engage with complementary friction surfaces on the friction shoes, moving said shoes inwardly and thereby causing the friction surfaces on the bottom of the shoes to engage frictionally with the wear plate on the side frame girder, the inward movement of the friction shoes being resisted by the resilient member interposed therebetween. When the bolster moves upwardly by reason of the recoil of the bolster springs, the action of the friction shoe and resilient member is such that the recoil action of the bolster springs is diminished in effect and dampened.

It may also be noted that to remove the side frame, it is necessary only to unfasten the nut and bolt assembly securing the wear plate to the side frame girder, lift the bolster upwardly to disengage the bolster coil springs and slip the side frame off the bolster end, the friction unit remaining in assembled relationship within the bolster.

It is to be understood that I do not wish to be limited by the exact embodiment of the device shown which is merely by way of illustration and not limitation as various and other forms of the device will, of course, be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

I claim:

1. In a car truck, a side frame, a bolster opening defined by a compression member, spaced guide columns, and a wall extending between said columns, a bolster received within said opening and having internal diagonal friction surfaces extending between the top and side walls of said bolster, a friction absorbing device enclosed within said bolster comprising wedge blocks having diagonal friction surfaces, a resilient member interposed therebetween and urging said blocks into engagement with said internal diagonal surfaces, a member supported from said blocks having frictional engagement therewith, means securing said member to said first-mentioned wall to maintain said frame and bolster in assembled relationship, and automatically interlocking means for holding said device in assembled relationship within said bolster.

2. In a quick wheel change truck, a side frame having a bolster opening, a bolster received therein, a friction absorbing device enclosed within said bolster comprising friction shoes having a resilient member interposed therebetween, diagonal surfaces formed within said bolster between top and side walls thereof in frictional engagement with said shoes, a flat member interlocked with said shoes for frictional engagement therewith, said member being secured to said frame for maintaining said bolster and frame in assembled relationship, means for limiting lateral motion of said bolster, and means accommodating relative vertical movement of said frame and bolster.

3. In a quick wheel change truck, a side frame having a bolster opening, a bolster received therein with an aperture in its bottom wall, a friction absorbing device enclosed within said bolster above said aperture and comprising friction shoes having a resilient member interposed therebetween, diagonal surfaces formed within said bolster in frictional engagement with said shoes, a member interlocked with said shoes and secured to said side frame through said aperture, means within said bolster cooperating with said shoes for limiting lateral motion of said bolster, and means on said shoes automatically interlocking with means in the side walls of said bolster to maintain said device in assembled relationship during assembly and dismantling of said bolster and side frame.

4. In a quick wheel change truck, a side frame having a bolster opening defined by bolster guide columns and top and bottom members, said bottom member having a box-like section forming a bridge wall between said columns, a bolster received in said opening having an aperture in its bottom wall, a friction absorbing device insertable through said aperture and associated with said bridge wall, said device being automatically interlocked in position within said bolster whereby said device is retained in assembly during dismantling of said bolster and side frame, and means for accommodating relative movement of said bolster and said frame, said means comprising slots in said bridge wall adjacent said columns adapted to accommodate the side walls of said bolster.

5. In a quick wheel change truck, a side frame having a bolster opening defined by bolster guide

columns and top and bottom members, said bottom member having a box section, a bolster received in said opening having an aperture in its bottom wall, a friction absorbing device insertable through said aperture and cooperating with said box section, said device being automatically interlocked within said bolster, whereby disassembly of said device is prevented during dismantling of said bolster and side frame, and means for accommodating relative movement of said bolster and said frame, said means comprising slots in said box section inwardly of said columns adapted to receive the side walls of said bolster.

6. In a quick wheel change truck, a side frame having a bolster opening, a bolster received therein having an aperture in one of its walls, a friction absorbing device enclosed in said bolster comprising friction shoes having resilient means interposed therebetween, diagonal friction surfaces within said bolster engaging said shoes, a member carried by said shoes for frictional engagement therewith and associated with said side frame through said aperture for tying said bolster and side frame together, and means for holding said device in assembled relationship within said bolster during assembly and disassembly of said bolster and side frame, said means including lugs on said shoes automatically interlocking with slots in the side walls of said bolster.

7. In a quick wheel change truck, a side frame having a bolster opening, a bolster received therein, a friction absorbing device enclosed within said bolster comprising friction shoes having a resilient member interposed therebetween, diagonal surfaces formed between top and side walls of said bolster in frictional engagement with said shoes, a member supported from said shoes and fastened to said frame to maintain said frame and bolster in assembled relationship, and stop means within said bolster abutting adjacent lower portions of said shoes for limiting lateral motion of said bolster.

8. In a quick wheel change truck, a side frame having a bolster opening, a bolster received therein, a friction absorbing device enclosed within said bolster comprising friction shoes having a resilient member interposed therebetween, diagonal friction surfaces extending between the top and side walls of said bolster engaging said shoes, a member carried by said shoes for frictional engagement therewith and associated with said frame, and means on said shoes automatically interlocking with the side walls of said bolster to retain said device in assembled relationship.

9. In a quick wheel change truck, a side frame having a bolster opening defined by bolster guide columns and top and bottom members, said bottom member having a box section, a bolster received in said opening having an aperture in its bottom wall, a friction absorbing device insertable through said aperture and automatically interlocked within said bolster and associated with said frame, and means for accommodating relative movement of said bolster and said frame including vertical slots in said section inwardly of said columns.

10. In a quick wheel change truck, a side frame having a bolster opening, a bolster received therein, a friction absorbing device enclosed within said bolster and comprising friction shoes presenting wedge faces and flat bottom faces, a resilient member interposed between said shoes, diagonal friction surfaces within said bolster engaging said wedge faces, a member carried by said shoes for frictional engagement with said flat bottom faces and associated with a member on said side frame, and automatic means for holding said device in assembled relationship within said bolster.

11. In a quick wheel change truck, a side frame having a bolster opening, a bolster received therein having an aperture in the bottom wall thereof, a friction absorbing device within said bolster, means for limiting lateral movement of said bolster comprising lugs formed adjacent opposite sides of said aperture for abutment with said device, and means securing said device to said side frame to retain said bolster and side frame in squared relationship.

12. In a quick wheel change truck, a side frame having a bolster opening, a bolster received therein, a friction absorbing device carried in said bolster, and means for maintaining said bolster and said side frame in assembled relationship, said means comprising a member supported from opposite ends of said device and secured intermediate its ends to a side frame member.

13. In a quick wheel change truck, a side frame having a bolster opening, a bolster received therein, a friction absorbing device carried in said bolster, and means for maintaining said bolster and said side frame in assembled relationship, said means including a member interlocked at opposite ends with said device, means for securing said member to said frame and comprising aligned lugs on said member and said frame, and a securing member.

14. In a quick wheel change truck, a side frame having a bolster opening, a bolster received therein having an aperture in its bottom wall to accommodate a member of said side frame, a friction absorbing device interlocked in position within said bolster and connected to said member whereby said bolster and side frame are maintained in assembly, and lugs adjacent said aperture for abutment with opposite sides of said device to limit lateral motion of said bolster.

15. In a quick wheel change truck, a side frame having a bolster opening, a bolster received therein, and means for limiting lateral movement of said bolster, said means including an aperture in the bottom wall of said bolster receiving a portion of said frame, a friction device operable within said bolster and associated with said bolster and said portion of said frame, and lugs formed on said wall adjacent opposite sides of said aperture for abutment with said friction device.

16. In a quick wheel change truck, a side frame having a bolster opening, a bolster received therein, a friction absorbing device operable within said bolster and comprising diagonal surfaces formed within said bolster between top and side walls thereof, and friction shoes resiliently supported in engagement with said surfaces, and means for connecting said bolster to said side frame, said means including a horizontal member interlocked at opposite ends with said device and secured to said side frame.

17. In a quick wheel change truck, a side frame having a bolster opening, a bolster received therein having an aperture in its bottom wall, a friction device operable within said bolster and associated with said bolster and with said side frame through said aperture, and means for limiting lateral movement of said bolster, said means comprising transverse lugs formed within said

bolster and abutting opposite lower portions of said friction device.

18. In a quick wheel change truck, a side frame having a bolster opening defined by top and bottom members, spaced columns, and a wall connecting said columns, a bolster received in said opening, an aperture in the bottom wall of said bolster, and a friction device enclosed and interlocked within said bolster and secured to said wall whereby said bolster and side frame are retained in assembled relationship.

19. In a quick wheel change truck, a side frame having a bolster opening defined by top and bottom members, spaced columns, and a wall connecting said columns, a bolster received in said opening, an aperture in the bottom wall of said bolster, a friction device operable within said bolster, interlocking means on said device and said bolster, and means securing said device to said wall, said interlocking means and said securing means serving as the sole means for tying said bolster and side frame together.

20. In a quick wheel change truck, a side frame having a bolster opening defined by top and bottom members, spaced columns, and a bridge wall connecting said columns, a bolster received in said openings, a friction device enclosed within said bolster and comprising a resilient member, tapering friction surfaces formed within said bolster, shoes urged into engagement with said surfaces by said resilient member, retaining means on said shoes engaging the side walls of said bolster, and a member engaging said shoes and secured to said wall to maintain said side frame and bolster in assembly.

21. In a quick wheel change truck, a side frame having a bolster opening defined by top and bottom members, spaced columns, and a bridge wall connecting said columns, a bolster received in said opening, a friction device enclosed within said bolster and comprising a resilient member, tapering friction surfaces formed within said bolster, shoes urged into engagement with said surfaces by said resilient member, retaining means on said shoes engaging the side walls of said bolster, a member associated with said shoes and said wall, and lugs on the bottom wall of said bolster for abutment with said shoes to limit relative lateral movement of said bolster and side frame.

22. In a quick wheel change truck, a side frame having a bolster opening defined by top and bottom members, spaced columns, and a wall extending between said columns, a bolster received in said opening and having an aperture in the bottom wall thereof, friction means enclosed within said bolster above said aperture, said means comprising diagonally arranged surfaces between the top and side walls of said bolster, friction shoes having faces engaging said surfaces, a resilient member compressed between said shoes, a member cooperating with said first mentioned wall and said shoes to tie said side frame and bolster together, and means on said shoes engaging said bolster to retain said device therewithin.

23. In a quick wheel change truck, a side frame having a bolster opening, a bolster received therein, a friction device operable within said bolster and comprising friction shoes and resilient means compressed therebetween, wedge face engagement between said shoes and said bolster, a member interlocked with said shoes and having flat face engagement therewith, said member being associated with said side frame, and automatic means retaining said device in assembled relationship within said bolster during assembling and dismantling of said bolster and side frame.

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