Jan. 8, 1946. D. M. LIGHT 2,392,599

TRUCK

Filed June 23, 1943 2 Sheets-Sheet 1

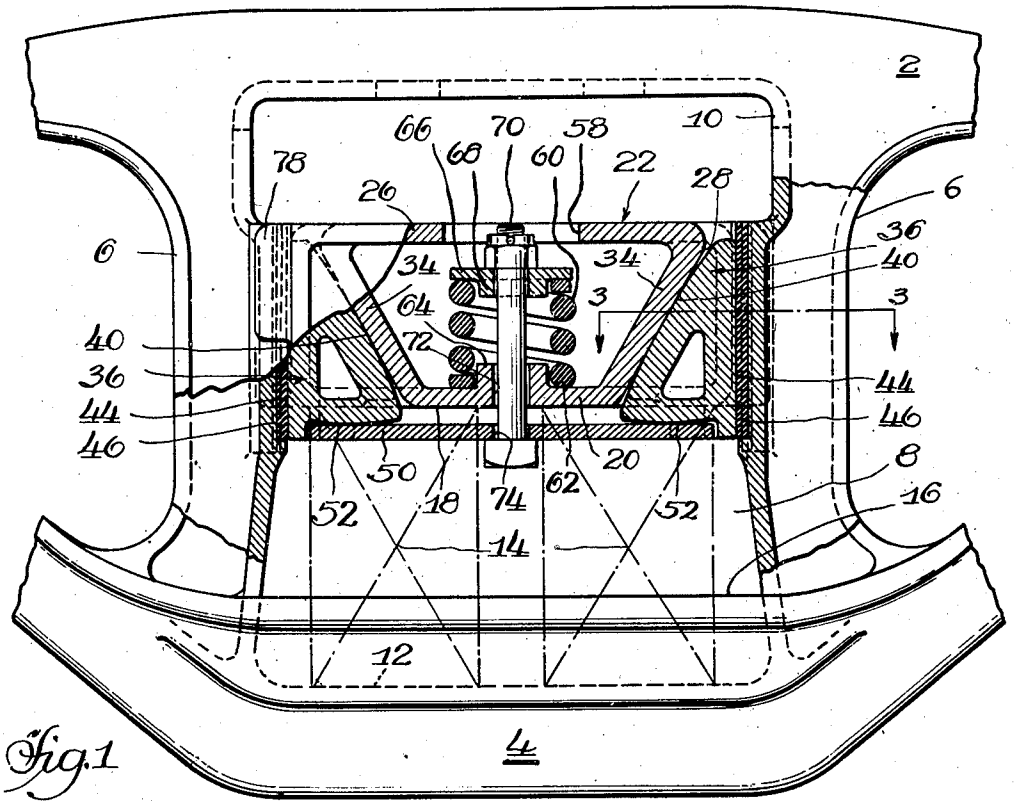


Fig. 1

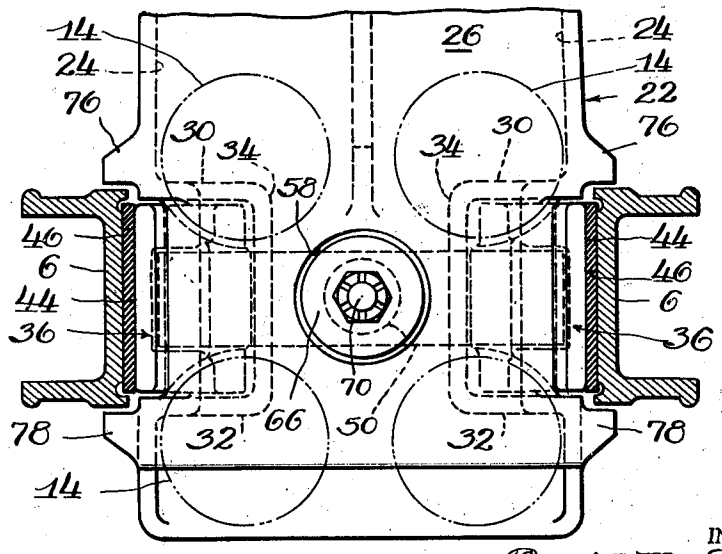


Fig. 2

INVENTOR.
David M. Light,
BY
Orin O. B. Farmer
Atty.

Jan. 8, 1946. D. M. LIGHT 2,392,599

TRUCK

Filed June 23, 1943 2 Sheets-Sheet 2

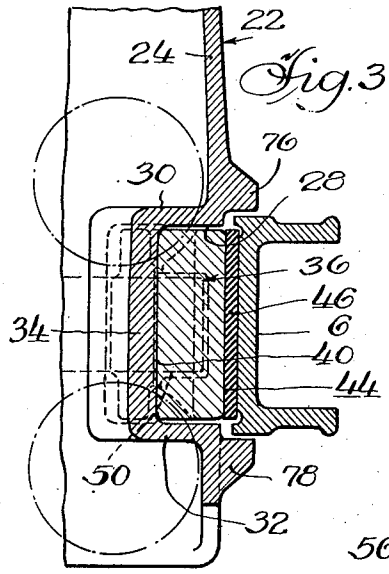


Fig. 3

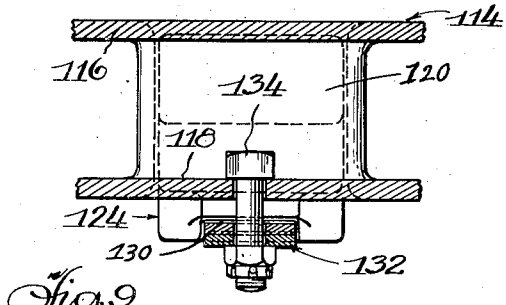


Fig. 9

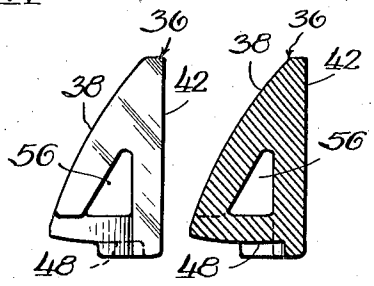


Fig. 4

Fig. 5

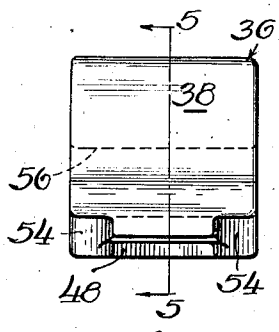
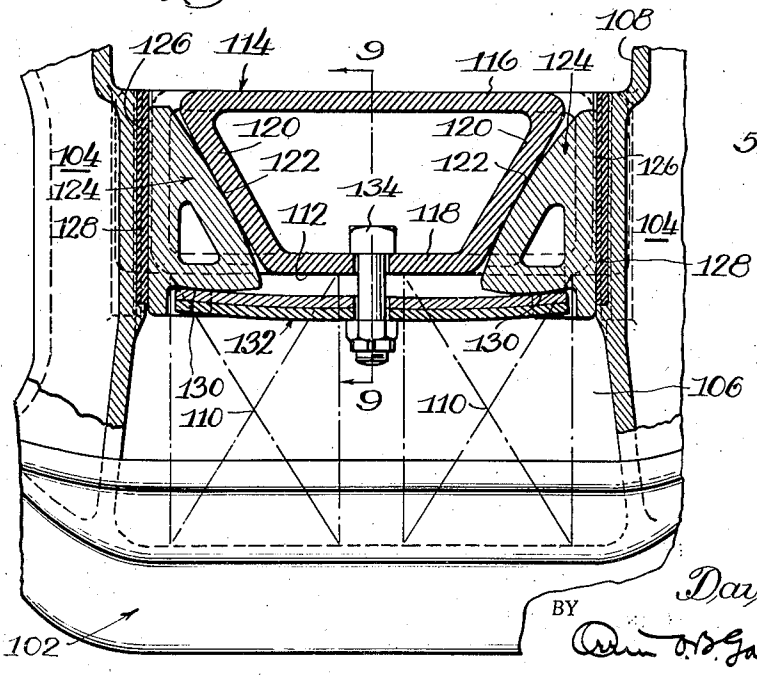


Fig. 6

Fig. 8



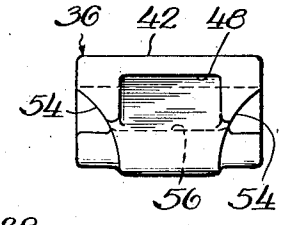


Fig. 7

INVENTOR.
David M. Light,
BY
Wm. O. B. Garner
Atty.

Patented Jan. 8, 1946 2,392,599

UNITED STATES PATENT OFFICE

2,392,599

TRUCK

David M. Light, Chicago, Ill., assignor to American Steel Foundries, Chicago, Ill., a corporation of New Jersey

Application June 23, 1943, Serial No. 491,903

27 Claims. (Cl. 105—197)

My invention relates to railway car trucks and more particularly to a truck incorporating a ride control device for frictionally controlling oscillations of the bolster supporting springs.

The general object of my device is to provide a ride control truck incorporating a quick wheel change feature whereby the bolster may be removed from the top of the bolster opening while the supporting spring group and the friction shoes remain in assembled relationship with the side frame.

A specific object of my invention is to design a truck of the above described type wherein a plurality of friction shoes are provided at opposite sides of the bolster in wedge engagement therewith and in frictional engagement with the side frame columns, said shoes being actuated by means of a plate member extending transversely of the bolster and engaged therewith for urging said shoes into said engagement. In one embodiment of my device the plate member is substantially rigid and is urged against the friction shoes by means of a compressed coil spring housed within the bolster and connected to said member, and in another embodiment of my device the plate member is formed as a spring and is engaged with the bolster by means adapted to flex said member against the shoes.

My invention comprehends friction shoes of novel form each having a wedge face on one side thereof, a friction surface on the opposite side thereof, and a recess in the bottom thereof for reception of the associated plate member, said shoe being arcuately relieved at opposite sides thereof to afford positioning means for the adjacent springs of the bolster supporting spring group.

In the drawings,

Figure 1 is a fragmentary side elevation of a railway car truck embodying my invention with portions of the bolster and associated friction means shown in section along a substantially vertical plane bisecting the side frame.

Figure 2 is a fragmentary top plan view of the structure shown in Figure 1 with the side frame shown in section through the columns thereof.

Figure 3 is a fragmentary sectional view taken in the horizontal plane indicated by the line 3—3 of Figure 1.

Figures 4 to 7 inclusive show in detail my novel form of friction shoe, Figure 4 being a side elevation thereof, Figure 5 being a sectional view taken in the plane indicated by the line 5—5 of Figure 6, Figure 6 being a rear elevation taken from the left as seen in Figure 4, and Figure 7 being a bottom plan view.

Figures 8 and 9 illustrate a modification of my invention, Figure 8 being a fragmentary view comparable to that of Figure 1, and Figure 9 being a sectional view in the transverse vertical plane indicated by the line 9—9 of Figure 8.

Describing my invention in detail, and referring first to the modification shown in Figures 1 to 3 inclusive, the side frame comprises the compression member 2 and the tension member 4 merging at each end thereof with a column 6 to define a bolster opening 8 having a widened upper portion 10 for a purpose hereinafter described. The tension member 4 is of conventional box-section beneath the bolster opening with the top chord of said box-section affording a seat as at 12 for the bolster supporting coil springs diagrammatically indicated at 14, 14, said top chord being formed at each of the inboard and outboard sides thereof with a flange 16 affording convenient positioning means for the springs 14, 14. The springs are seated as at 18 against the bottom wall 20 of the bolster generally designated 22, said bolster being of box-section with the spaced side walls 24, 24, the top wall 26, and the beforementioned bottom wall 20, and at each side thereof the bolster is provided with a pocket 28 for the reception of an associated friction shoe, as hereinafter described, said pocket being defined by the inboard and outboard webs 30 and 32 and by the diagonal wall 34 merging with said webs and with the top and bottom walls 26 and 20, each diagonal wall 34 affording on the exterior surface thereof a wedge face for complementary engagement with the associated friction shoe, as hereinafter described.

Each friction shoe 36 has the form illustrated in Figures 4 to 7 inclusive, said shoe comprising on the rear surface thereof the wedge face 38 for complementary engagement as at 40 with the wedge face formed on the exterior surface of the adjacent bolster wall 34, and on the front surface thereof said shoe is provided with a friction face 42 for frictional engagement as at 44 with the adjacent column mounted wear plate 46. On the bottom thereof said shoe is provided with a recess 48 for the reception of the actuating plate member 50, the shoe being formed at its lower extremity with a crowned abutment surface for engagement as at 52 with said member 50. At opposite sides thereof the shoe is arcuately relieved at 54, 54 to afford positioning means for the adjacent bolster supporting springs 14, 14 and to facilitate seating of said shoes upon said springs during assembly and disassembly of the bolster,

as hereinafter more fully described. It may be noted that the shoe is cored away as at 56, to lighten the same, and it may also be noted that the wedge surface 38 of the shoe is crowned to afford rocking action thereof against the associated bolster wedge surface.

The top wall 26 of the bolster is provided with an opening 58 for the reception of a coil spring 60, seated as at 62 against the bottom wall 20 of said bolster, said bottom wall being provided with a spring positioning boss 64. A spring plate 66 is seated against the top of said spring and comprises positioning means 68 therefor, said plate being compressed against said spring by means of a bolt and nut assembly 70. The bolt and nut assembly extends through an opening 72 in the bottom wall of the bolster and also through an opening 74 in the plate member 50, the lower end of said bolt and nut assembly being engaged with said member 50 whereby as the bolt and nut assembly is tightened the reaction of the compressed spring 60 is transmitted to the plate member 50 which is urged upwardly, thereby urging the friction shoes upwardly and outwardly against the bolster walls 34, 34 into engagement with the wear plates 46, 46, as above described. It will be understood that by means of the bolt and nut assembly the compression of the spring 60 may be adjusted.

Each side of the bolster is provided with inboard and outboard gibs 76 and 78, the outboard gibs 78, 78 being of less depth (Figure 1) than that of the widened upper portion 10 of the bolster opening whereby said bolster may be elevated therein and removed therefrom with the friction shoes and associated actuating means during a quick wheel change.

In assembling my novel truck, the springs 14, 14 are seated upon the tension member. Thereafter, the bolster, the friction shoes 36, 36, and the actuating means therefor are entered at the top of the bolster opening and lowered into cooperative relationship with said springs.

The nut of the bolt and nut assembly is then tightened to compress the spring 60, whereupon the plate 50 is urged upwardly to lift the shoes 36, 36 out of engagement with the springs 14, 14 and into tight wedge engagement with the bolster walls 34, 34. The bolster may be removed from the bolster opening during a quick wheel change by a reversal of the process of assembling.

It will be understood that the arcuate portions 54, 54 of the shoes afford positioning means for the upper ends of the springs 14, 14, to prevent creeping movement thereof during vertical and horizontal oscillations of the bolster.

Figures 8 and 9 illustrate a modification of my invention wherein the side frame generally designated 102 is substantially identical with that disclosed in Figure 1 and comprises the spaced columns 104, 104 defining the bolster opening 106 therebetween, said bolster opening having a widened upper portion 108 to afford a quick wheel change, as hereinafter described. The bolster supporting springs 110, 110 are seated on the side frame and afford support as at 112 for the bolster generally designated 114, said bolster being generally similar to that disclosed in Figures 1 to 3 and comprising the top and bottom walls 116 and 118 merging at opposite sides thereof with the diagonal walls 120, 120, said diagonal walls being in wedge engagement as at 122, 122 with the friction shoes 124, 124. The shoes are in frictional engagement as at 126, 126 with the column mounted wear plates 128, 128, and said shoes are in abutment as at 130, 130 with the plate spring assembly generally designated 132, said assembly comprising one or more superposed spring plates engaged with the bolster by means of a bolt and nut assembly 134.

It will be understood that the bolt and nut assembly may be tightened to flex the plate spring assembly 132 against the friction shoes 124, 124, whereby the latter are urged upwardly and outwardly against the diagonal walls 120, 120 of the bolster into frictional engagement at 126, 126 with the column mounted wear plates.

The bolster, as in the previous embodiment of my device, is provided with inboard and outboard gibs for interlocking with the columns, the outboard gibs being of less depth than the widened upper portion 108 of the bolster opening whereby the bolster may be elevated in the bolster opening and removed therefrom during a quick wheel change, and it will be readily understood that in this as well as the previous embodiment of my device, the friction shoes and the spring plate assembly 132 may be removed with the bolster from the top of the bolster opening if desired inasmuch as the bolt and nut assembly 134 does not extend above the top wall of the bolster.

Thus in assembling the embodiment of my invention disclosed in Figures 8 and 9, the springs 110, 110 are first seated upon the side frame. Thereafter, the bolster 114, with the friction shoes 124, 124 and the spring plate assembly 132 in assembled relationship therewith, may be entered at the top of the bolster opening and lowered upon the springs 110, 110. The bolt and nut assembly 134 may then be tightened to flex the assembly 132 against the friction shoes and thereby lift the same out of engagement with the springs 110, 110 and into tight wedge engagement with the diagonal bolster walls 120, 120.

It will be understood that in the embodiment of my device illustrated in Figures 8 and 9 the side frame and the friction shoes are identical with those illustrated in Figures 1 to 3, and the bolster is identical with that illustrated in Figures 1 to 3 except for the fact that the opening in the top wall of the bolster and the spring positioning means on the bottom wall thereof are eliminated, inasmuch as no internal spring is required in this embodiment.

It is to be understood that I do not wish to be limited by the exact embodiments of the device shown which are 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 railway car truck, a side frame having spaced columns and an intervening bolster opening, said opening having a widened upper portion, a spring group on said frame in said opening, a bolster supported from said group and having wedge means at opposite sides thereof sloping upwardly toward respective columns, friction shoes in engagement with respective wedge means and respective columns, a plate member beneath said bolster and extending transversely thereof, said plate member being engaged with said shoes to afford support therefor, and means associated with said bolster and said member for urging the latter upward with respect to the bolster and thereby urging said shoes into tight engagement with said wedge means and said columns, and inboard and outboard gibs on each side of said bolster for abutment with inboard and outboard surfaces on the adjacent column, the outboard

gibs being of less depth than that of the upper portion of said bolster opening whereby said bolster, said shoes, and the actuating means therefor may be elevated therein and removed therefrom while said spring group remains in normal assembled relationship with the side frame, the surfaces of said shoes in engagement with said wedge means being crowned to afford a rocking action for said shoes against said wedge means.

2. In a railway car truck, a side frame having spaced columns and an intervening bolster opening, said opening having a widened upper portion, a spring group on said frame in said opening, a bolster supported from said group and having wedge means at opposite sides thereof sloping upwardly toward respective columns, friction shoes in engagement with respective wedge means and respective columns, a plate member beneath said bolster and extending transversely thereof, said plate member being engaged with said shoes to afford support therefor, and means having an operative connection with said bolster and said member for urging the latter upward and thereby urging said shoes into tight engagement with said wedge means and said columns, and inboard and outboard gibs on each side of said bolster for abutment with inboard and outboard surfaces on the adjacent column, the outboard gibs being of less depth than that of the upper portion of said bolster opening whereby said bolster, said shoes, and the actuating means associated therewith may be elevated therein and removed therefrom while said spring group remains in normal assembled relationship with the side frame, said shoes having positioning means on the sides thereof for the adjacent springs of said group.

3. In a railway car truck, a side frame having spaced columns and an intervening bolster opening, said opening having a widened upper portion, a spring group on said frame in said opening, a bolster supported from said group and having wedge means at opposite sides thereof sloping upwardly toward respective columns, friction shoes in engagement with respective wedge means and respective columns, a plate member beneath said bolster and extending transversely thereof, said plate member being engaged with said shoes to afford support therefor, and means having an operative connection with said bolster and said member for urging the latter upward and thereby urging said shoes into tight engagement with said wedge means and said columns, and inboard and outboard gibs on each side of said bolster for abutment with inboard and outboard surfaces on the adjacent column, the outboard gibs being of less depth than that of the upper portion of said bolster opening whereby said bolster, said plate member, and said shoes may be elevated therein and removed therefrom while said spring group remains in normal assembled relationship with the side frame.

4. In a railway car truck, a side frame having spaced columns and an intervening bolster opening, said opening having a widened upper portion, a spring group on said frame in said opening, a bolster supported from said group and having wedge surfaces at opposite sides thereof sloping upwardly toward respective columns, friction shoes in engagement with respective surfaces and respective columns, a member beneath said bolster and extending transversely thereof, said member being engaged with said shoes to afford support therefor, and means operatively associated with said bolster and said member for adjustably urging the latter upward with respect to said bolster and thereby urging said shoes into tight engagement with said surfaces and said columns, and inboard and outboard gibs on each side of said bolster for abutment with the adjacent column, the outboard gibs being of less depth than that of said upper portion of said bolster opening whereby said bolster, said shoes, and the actuating means therefor may be elevated therein and removed therefrom during a quick wheel change.

5. In a railway car truck, a side frame having spaced columns and an intervening bolster opening, a spring group on said frame in said opening, a bolster supported from said group, said bolster having wedge surfaces at opposite sides thereof sloping toward respective columns, friction shoes engaging respective surfaces and respective columns, a member spaced from said bolster and engaged with said shoes for actuation thereof, and means having an operative connection with said bolster and said member for adjustably urging the latter toward the bolster and thereby urging said shoes into tight engagement with said surfaces and said columns, said means comprising resilient means housed within the bolster and seated thereagainst, and a connection between said resilient means and said member, said connection comprising a bolt and nut assembly extending through aligned openings in said bolster and said member, and a spring plate engaged with said assembly and compressed against said resilient means.

6. In a railway car truck, a side frame having spaced columns and an intervening bolster opening, said opening having a widened upper portion, a spring group on said frame in said opening, a bolster supported from said group and having wedge surfaces at opposite sides thereof sloping upwardly toward respective columns, friction members in engagement with respective surfaces and respective columns, a plate member beneath said bolster and extending transversely thereof, said plate member being in abutment with said friction members to afford support therefor, and means having an operative connection with said bolster and said plate member for urging the latter upward and thereby urging said friction members into tight engagement with said surfaces and said columns.

7. In a railway car truck, a side frame having spaced columns and an intervening bolster opening, a spring group on said frame in said opening, a bolster supported from said group, said bolster having wedge surfaces at opposite sides thereof sloping toward respective columns, friction shoes engaging respective surfaces and respective columns, a member spaced from said bolster and engaged with said shoes for actuation thereof, and means engaged with said bolster and said member for adjustably urging the latter toward the bolster and thereby urging said shoes into tight engagement with said surfaces and said columns, said means comprising resilient means housed within the bolster and seated thereagainst, and a connection between said resilient means and said member.

8. In a railway car truck, a side frame having spaced columns and an intervening bolster opening, a spring group on said frame in said opening, a bolster supported from said group, said bolster having wedge means at opposite sides thereof, friction shoes engaging respective wedge means and respective columns, a flexible member spaced from said bolster and engaged with said shoes

for actuation thereof, and means engaged with said bolster and said member for flexing the latter against said shoes.

9. In a railway car truck, a side frame having spaced columns and an intervening bolster opening, a spring group on said frame in said opening, a bolster supported from said group, said bolster having wedge means at opposite sides thereof, friction shoes engaging respective wedge means and respective columns, a flexible member spaced from said bolster, extending transversely thereof, and engaged with said shoes for actuation thereof, and means engaged with said bolster and said member for flexing the latter against said shoes, said means comprising a bolt and nut assembly.

10. In a railway car truck, a side frame having spaced columns and an intervening bolster opening, a spring group on said frame in said opening, a bolster supported from said group and having wedge surfaces at opposite sides thereof sloping toward respective columns, friction shoes in engagement with respective surfaces and respective columns, an actuating member extending transversely of said bolster and engaged with said shoes, resilient means under compression bearing against a wall of said bolster, and means for transmitting reaction of said resilient means to said actuating member.

11. In a railway car truck, a side frame having spaced columns and an intervening bolster opening, a spring group on said frame in said opening, a bolster supported from said group, said bolster having wedge means at opposite sides thereof, friction shoes engaging respective wedge means and respective columns, a member spaced from said bolster and engaged with said shoes for actuation thereof, and means having an operative connection with said bolster and said member for urging the latter toward the bolster and thereby urging said shoes into tight engagement with said wedge means and said columns.

12. In a railway car truck, a side frame having spaced columns and an intervening bolster opening, resilient means on said frame in said opening, a bolster supported from said means and comprising wedge means sloping upwardly at opposite sides thereof toward respective columns, friction means in engagement with respective wedge means and respective columns, actuating means extending transversely of the bolster and disposed therebeneath, said actuating means being engaged with said friction means, and means operatively associated with said bolster and said actuating means for urging the latter upwardly with respect to said bolster.

13. In a railway car truck, a side frame having spaced columns and an intervening bolster opening, resilient means on said frame in said opening, a bolster supported from said means and having wedge means at opposite sides thereof, friction members in engagement with said wedge means and said columns, and means carried by the bolster for resiliently urging said friction members into said engagement, said last-mentioned means comprising a member extending transversely of said bolster and bearing against said friction members.

14. In a railway car truck, a side frame having spaced columns and an intervening bolster opening, resilient means on said frame in said opening, a bolster supported from said means and having wedge means at opposite sides thereof, friction members in engagement with said wedge means and said columns, and means carried by the bolster for resiliently urging said members into said engagement, said last-mentioned means comprising a flexible member extending transversely of said bolster and flexed against said friction members.

15. In a railway car truck, a side frame having spaced columns and an intervening bolster opening, resilient means on said frame in said opening, a bolster supported from said resilient means, said bolster having wedge means at opposite sides thereof, friction shoes in engagement with respective wedge means and respective columns, a flexible member in abutment with said shoes, and means engaged with said bolster and said member for flexing the latter against said shoes.

16. In a railway car truck comprising a side frame with spaced columns and a bolster spring-supported therebetween, the combination of friction elements in engagement with respective columns and with wedge means on said bolster, and actuating means for urging said elements into said engagement comprising a substantially horizontal flat member extending transversely of the bolster, said member being engaged adjacent the ends thereof with said elements, and spring means carried by the bolster and operatively connected to said member for urging the latter against said elements.

17. In a railway car truck comprising a side frame with spaced columns and a bolster spring-supported therebetween, the combination of friction elements in engagement with respective columns and with wedge means on said bolster, actuating means for urging said elements into said engagement comprising a substantially horizontal flat member extending transversely of the bolster, said member being engaged adjacent the ends thereof with said elements, and compressed resilient means housed within the bolster and operatively connected to said member.

18. In a friction shoe for a railway car truck, a member comprising a friction face on the front surface thereof and a wedge face on the rear surface thereof, a recess in the bottom of said member for reception of associated actuating means, and arcuate spring positioning surfaces in opposite sides of said member adjacent the bottom thereof.

19. In a railway car truck comprising a side frame with spaced columns and a bolster spring-supported therebetween, the combination of friction elements in engagement with respective columns and with wedge means on said bolster, and actuating means for urging said elements into said engagement comprising a substantially horizontal flat flexible member extending transversely of the bolster, said member being engaged adjacent its ends with said elements and being connected to the bolster.

20. In a friction shoe, a member having a front friction face and a rear wedge face angularly disposed with respect to said friction face, a crowned surface on the bottom of said member for engagement with associated actuating means, and an arcuate spring positioning recess in each side of said member.

21. In a railway car truck, a side frame comprising a column, a bolster spring-supported from said frame, a substantially vertical compressed spring seated at one end thereof against abutment means on the bolster, a wedge surface on said bolster sloping toward the column, a friction shoe in engagement with said column and surface, and an operative connection between said shoe and said spring whereby the latter is operable to urge said shoe into said engage-

ment, said connection including a rigid member engaging the shoe, and means connecting said rigid member with the opposite end of said spring.

22. In a railway car truck, a side frame, a bolster spring-supported therefrom, and friction means comprising spaced friction surfaces on said frame, friction shoes engaging respective surfaces and engaging wedge means on said bolster, and actuating means for said shoes comprising a rigid member engaged at its opposite ends with respective shoes, and resilient means compressed against the bolster and operatively connected to said member intermediate its ends for transmitting reaction of said resilient means thereto.

23. In a railway car truck, a side frame, a bolster spring-supported therefrom, and friction means comprising spaced friction surfaces on said frame, spaced friction shoes engaging respective surfaces and respectively engaging spaced wedge means on said bolster, and actuating means for said shoes comprising a flexible member engaged at its opposite ends with respective shoes, and means connected to the bolster and to said flexible member intermediate its ends for flexing said member against said shoes.

24. In a railway car truck, a supporting member with spaced columns, a member resiliently supported on said supporting member between said columns, spaced friction means on respective columns, spaced friction shoes engaging respective friction means and respectively engaging spaced wedge means on the supported member, and actuating means for said shoes comprising a rigid member bearing at its opposite ends against respective shoes, and a compressed spring housed within said supported member and operatively connected to said rigid member intermediate its ends for urging the latter against said shoes.

25. In a railway car truck, a supporting member, a supported member resiliently mounted thereon, spaced friction surfaces on one of said members, spaced wedge means on the other of said members, friction shoes engaging respective surfaces and respective wedge means, and actuating means for said shoes comprising a flat flexible member bearing adjacent its opposite ends against respective shoes, and means connected to said other member and to said flexible member intermediate its ends for flexing the latter against said shoes.

26. In a friction shoe, a member having a front friction face and a rear wedge face angularly disposed with respect thereto, an abutment surface on the bottom of said member for engagement with associated actuating means, and an arcuate spring positioning recess in each side of said member.

27. In a railway car truck comprising a side frame including spaced columns and a bolster spring-supported from said frame between said columns, friction means including friction elements in wedge engagement with said bolster and in frictional engagement with said columns along surfaces extending transversely of said frame, resilient means compressed against abutment means on the bolster and housed therewithin, and means for transmitting reaction of said resilient means to said elements, including a member extending longitudinally of said frame and operatively engaged with said elements.

DAVID M. LIGHT.