Oct. 29, 1946. H. C. KEYSOR 2,410,032

TRUCK

Filed May 15, 1944 2 Sheets-Sheet 1

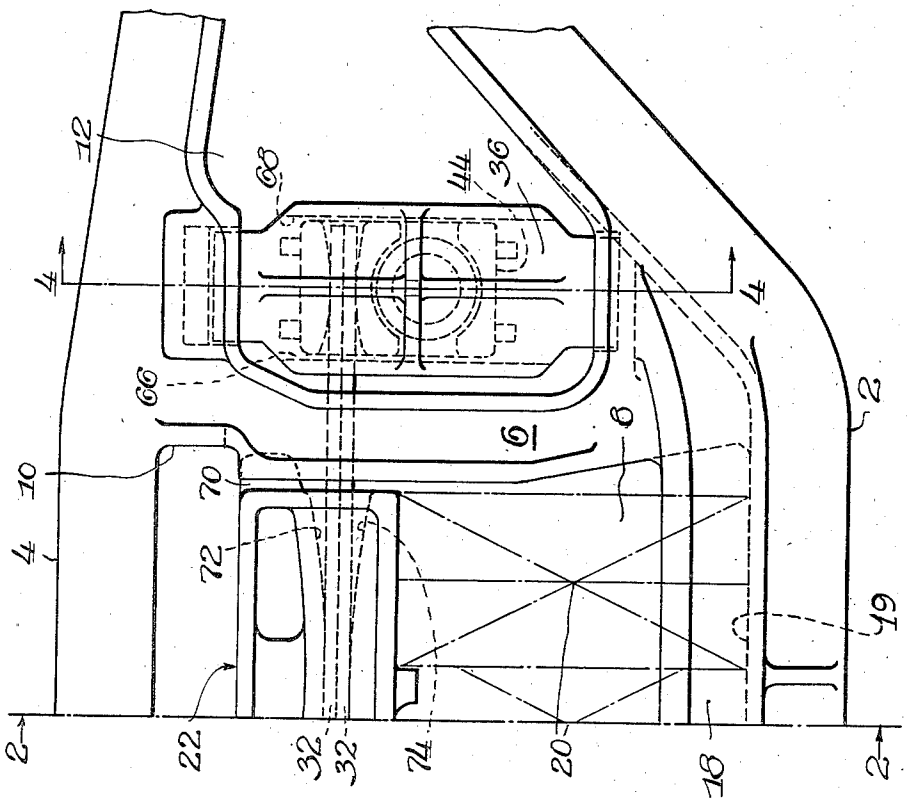


Fig. 1

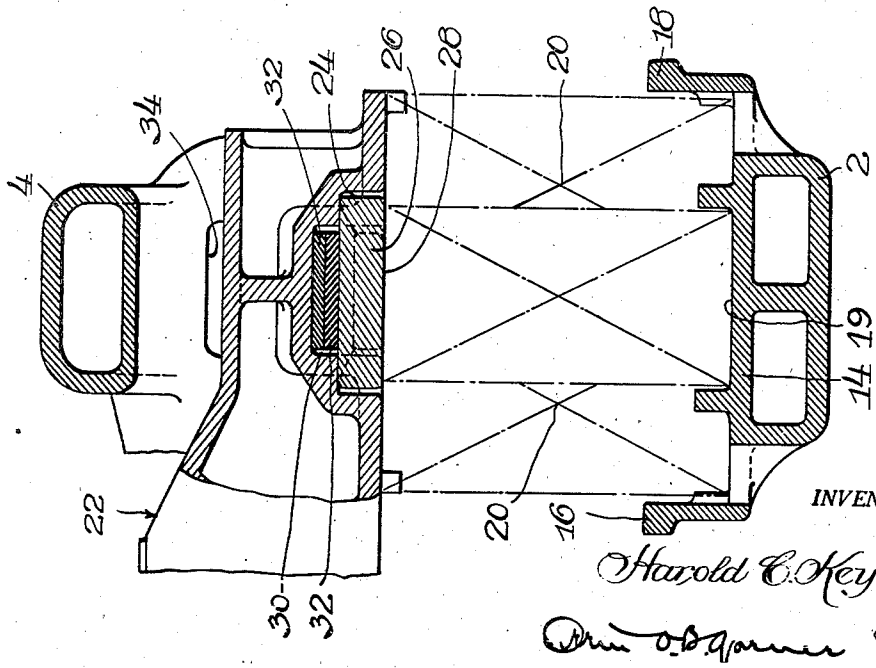


Fig. 2

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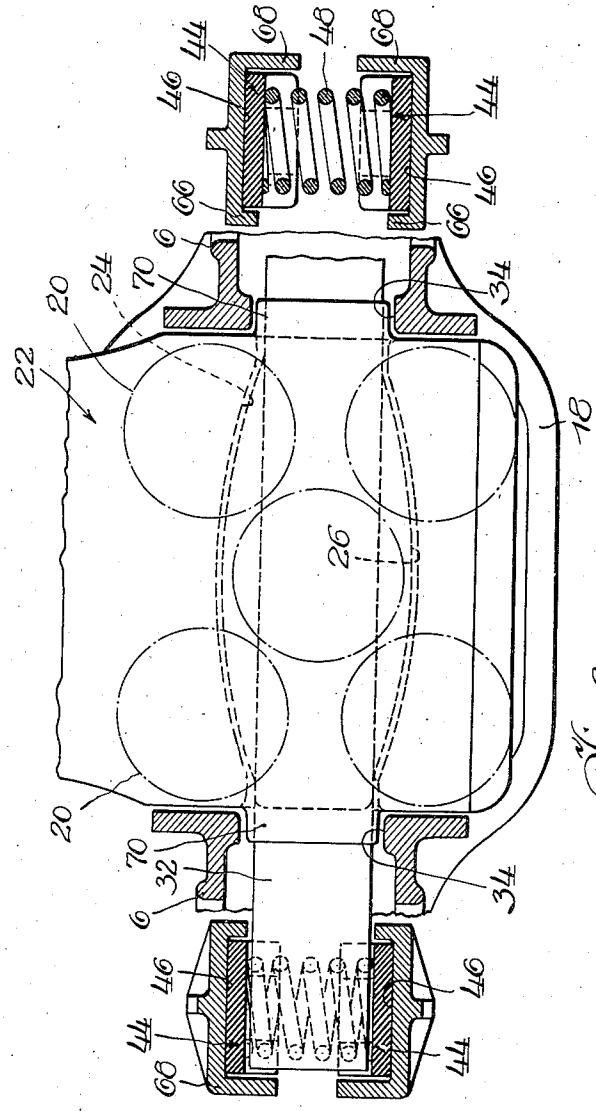


Fig. 3

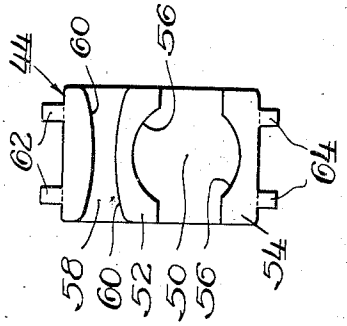


Fig. 5

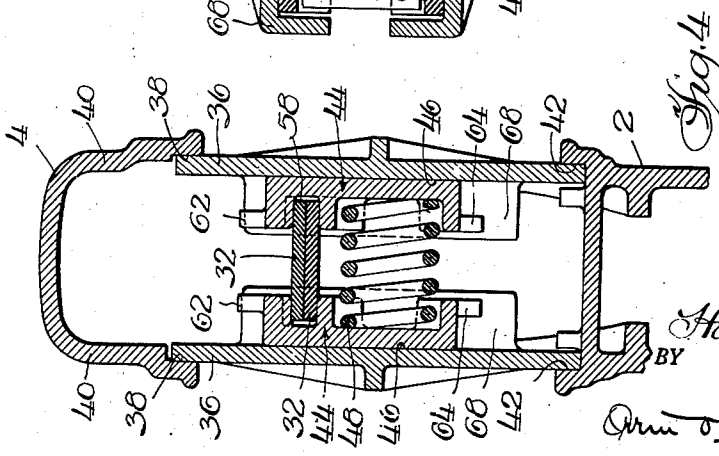


Fig. 4

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Patented Oct. 29, 1946

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UNITED STATES PATENT OFFICE

2,410,032

TRUCK

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Application May 15, 1944, Serial No. 535,616

29 Claims. (Cl. 105—197)

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My invention relates to railway car trucks and more particularly to a ride control truck wherein friction means is provided for dampening vertical oscillations of the bolster.

The general object of my invention is to devise friction means for dampening relatively small bolster oscillations and other friction means for dampening relatively great bolster oscillations.

More specifically, I provide a leaf spring assembly to which the truck bolster is connected, said assembly being capable of dampening relatively small oscillations of the bolster, and I also provide friction means operatively connected to said assembly for actuation thereby in the event of relatively great bolster oscillations.

My invention comprehends a bolster and friction shoes of novel form comprising abutment means for engagement with the leaf spring assembly and particularly adapted to permit the flexure thereof necessary to accomplish the above-mentioned objects.

Another object of my invention is to design a truck such as above described, wherein the various elements thereof are so formed and arranged as to accommodate a quick wheel change wherein the bolster is elevated in the bolster opening and removed therefrom while the bolster supporting springs and associated friction means remain in normal assembled relationship with the side frame.

In the drawings,

Figure 1 is a fragmentary side elevation of a railway car truck embodying my invention, only one end thereof being illustrated inasmuch as the truck is symmetrical about its transverse center line.

Figure 2 is a fragmentary sectional view taken in the transverse vertical plane indicated by the line 2—2 of Figure 1.

Figure 3 is a fragmentary top plan view of the structure shown in Figures 1 and 2 with portions of the side frame and associated friction devices broken away to more clearly illustrate the connection between the bolster and the friction devices.

Figure 4 is a sectional view taken in the transverse vertical plane indicated by the line 4—4 of Figure 1.

Figure 5 is an elevational view of one of my novel friction shoes, taken from the leaf spring engaging face thereof.

Describing my invention in detail, the side frame comprises the tension and compression members 2 and 4 and spaced columns 6, 6 defining therewith a central bolster opening 8 with a

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widened upper portion 10 for a purpose hereinafter described in detail; and each column 6 defines with the tension and compression members a window opening 12 adjacent one end of the frame.

The tension member 2 is of box section beneath the bolster opening, as best seen in Figure 2, with the top chord 14 thereof widened and formed with upstanding inboard and outboard flanges 16 and 18 defining a spring seat 19 upon which is seated a group of bolster supporting coil springs diagrammatically indicated at 20, 20.

The bolster, general'y designated 22, is a box-like member with the bottom wall thereof offset to define a recess 24 extending transversely of the bolster and receiving therewithin a spring seat block 26 which is seated as at 28 (Figure 2) on the springs 20, 20. The bolster recess 24 is provided with a relatively narrow upper portion 30 for the reception of a leaf spring assembly comprising a plurality of leaf springs 32, 32, each end of said assembly extending through an opening 34 in the adjacent column and into the adjacent window opening 12 for actuation of a friction device mounted therein.

Each friction device comprises spaced inboard and outboard friction panels 36, 36 positioned at their upper ends within recesses 38, 38 formed in the inboard and outboard walls 40, 40 of the compression member 4, as best seen in the sectional view of Figure 4, and the lower ends of the panels 36, 36 are received within recesses 42, 42 in the tension member 2. Spaced identical friction shoes 44, 44 are frictionally engaged with the respective panels 36, 36 as at 46, 46, and a spring 48 is compressed between said shoes.

Figure 5 illustrates in detail the configuration of one of my novel friction shoes 44, 44, and it will be noted that the rear face of said shoe is provided with a spring seat 50 for the above-mentioned spring 48, said seat being defined between the top and bottom ledges 52 and 54 formed on their adjacent edges with arcuate spring positioning surfaces 56, 56. Above the spring seat 50, the rear face of the shoe is provided with a transverse slot 58 for the reception of the leaf springs 32, 32, the top and bottom margins of said slot being arcuately formed as at 60, 60 to accommodate flexing of said springs for a purpose hereinafter described. It may be noted that the shoes are provided with a pair of top assembly lugs 62, 62 and a pair of bottom assembly lugs 64, 64, whereby each pair of shoes may be interlocked by assembly links (not shown) looped over the lugs 62, 62 and 64, 64 for the purpose of main-

taining the shoes and the spring 48 in a unit which may be conveniently assembled and disassembled in a manner hereinafter described in particular.

It may be noted that each friction panel is provided with spaced substantially vertical flanges 66 and 68 at opposite sides thereof, the flanges 66, 66 on respective panels being spaced a sufficient distance from each other to accommodate the leaf springs 32, 32. The flanges 68, 68, however, are of greater width than the flanges 66, 66 for the purpose of maintaining the springs 32, 32 against excessive movement longitudinally of the side frame.

Each side of the bolster is provided with a lug or gib 70 received within the opening 34 in the adjacent column 6 to afford an interlock between the side frame and the bolster; and it may be clearly seen in Figure 1 that the lugs 70, 70 are of less depth than the widened upper portion 10 of the bolster opening to accommodate the elevation of the bolster therein for convenient removal from the top thereof, during a quick wheel change, while the springs 20, 20 and the other truck elements remain in normal assembled relationship with the side frame.

It may be noted that the surface of the bolster defining the top of the recess 24 is arcuately formed as at 72 (Figure 1) and, likewise, the top of the block 26 is arcuately formed as at 74 in order to accommodate flexure of the leaf springs 32, 32 as the bolster oscillates on its supporting springs 20, 20. It will be understood that by means of the arrangement above described, relatively small oscillations of the bolster will be permitted by the flexure of the leaf springs 32, 32, which thus develop friction therebetween to afford control of such oscillations without actuating the friction shoes 44, 44. On the other hand, relatively great oscillations of the bolster will cause the springs 32, 32 to move the friction shoes 44, 44 vertically against the friction panels 36, 36, thus developing a relatively great amount of friction, which is desirable under such conditions.

In assembling my novel truck, the springs 32, 32 are first inserted into the column openings 34, 34, the springs being turned edgewise to accommodate this insertion, and thereafter the springs 32, 32 are elevated to the upper extremities of said column openings 34, 34 and are moved longitudinally of the frame until they are completely withdrawn from one window 12. Thereafter, the associated friction device is assembled within said window 12 with the slots 58, 58 in the friction shoes disposed above the upper level of the flanges 66 and 68 on the friction panels 36, 36. The leaf springs 32, 32 are then inserted into the slots 58, 58 and are moved therethrough into the window 12 until their opposite ends are withdrawn from the other window. Thereafter, the other friction device is assembled within the other window with the friction shoe slots 58, 58 disposed above the upper level of the friction panel flanges 66 and 68, thus permitting the leaf springs 32, 32 to be inserted into the friction shoe slots. The springs 20, 20 and the block 24 are then assembled in the bolster opening 8 and the leaf springs 32, 32 are moved downwardly along with the friction shoes 44, 44 until the lower leaf spring 32 engages the block 26. The bolster is then inserted at the top of the bolster opening and lowered onto the leaf spring assembly and the springs 20, 20.

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 railway car truck, a side frame comprising spaced columns defining spaced windows and an intermediate bolster opening, said columns having openings therethrough aligned longitudinally of said frame, a friction device in each window comprising inboard and outboard friction surfaces on said frame, spaced friction shoes engaging respective surfaces, and resilient means urging said shoes into said engagement, a spring group on said frame in said bolster opening, a spring seat block supported on said group and comprising an arcuate top surface, a bolster supported on said group and comprising a downwardly facing arcuate surface spaced above said first-mentioned surface, said bolster comprising interlocking means engaging said columns to afford an interlock therewith, and a leaf spring assembly supported on said block in engagement with said arcuate surfaces, each extremity of said assembly extending through the adjacent column opening and having an operative connection with the associated friction shoes, said operative connection comprising slots in the adjacent faces of said last-mentioned shoes, said slots having arcuate top and bottom surfaces bearing against said assembly.

2. In a railway car truck, a side frame comprising spaced columns defining spaced windows and an intermediate bolster opening having a widened upper portion, said columns having openings therethrough aligned longitudinally of said frame, a friction device mounted on said frame in each window, a spring group seated on said frame in said bolster opening, a block supported on said group and comprising an arcuate top surface, a bolster supported on said group and comprising a downwardly facing arcuate surface spaced above said first-mentioned surface, said bolster comprising integral interlocking means engaging said columns to afford an interlock between said bolster and said frame, and a leaf spring assembly supported on said block in abutment with said arcuate surfaces, each extremity of said assembly extending through the adjacent column opening and having an operative connection with the associated friction device, said interlocking means being of less depth than the widened upper portion of said bolster opening, whereby said bolster may be elevated therein and removed therefrom during a quick wheel change.

3. In a railway car truck, a side frame comprising spaced columns defining spaced windows and an intermediate bolster opening, said columns having openings therethrough aligned longitudinally of said frame, a friction device in each window comprising inboard and outboard friction surfaces on said frame, spaced friction shoes engaging respective surfaces, and resilient means urging said shoes into said engagement, a spring group on said frame in said bolster opening, a spring seat block supported on said group and comprising an arcuate top surface, a bolster supported on said group and comprising a downwardly facing arcuate surface spaced above said first-mentioned surface, said bolster comprising interlocking means engaging said columns to afford an interlock therewith, and a leaf spring assembly supported on said block in engagement

with said arcuate surface, each extremity of said assembly extending through the adjacent column opening and having an operative connection with the associated friction shoes, said block being recessed in said bolster and comprising a bottom surface substantially coplanar with the bottom thereof.

4. In a railway car truck, a side frame comprising spaced columns defining spaced windows and an intermediate bolster opening, a friction device in each window comprising inboard and outboard friction panels mounted on said frame, spaced friction shoes engaging respective panels, and resilient means under compression between said shoes for urging the same into said engagement, a spring group on said frame in said bolster opening, a block supported on said group and comprising an arcuate top surface, a bolster supported on said group and comprising a downwardly facing arcuate surface spaced above said first-mentioned surface, a leaf spring assembly supported on said block in engagement with said arcuate surfaces, each end of said assembly extending through the adjacent column and being slidably interlocked with the associated friction shoes for actuation thereof, and a flange on at least one panel of each device for abutment with the adjacent extremity of said assembly to limit movement thereof longitudinally of the frame.

5. In a railway car truck, a side frame comprising spaced columns defining spaced windows and an intermediate bolster opening, said columns having openings therethrough aligned longitudinally of said frame, a friction device in each window comprising inboard and outboard friction surfaces on said frame, spaced friction shoes engaging respective surfaces, and resilient means urging said shoes into said engagement, a spring group on said frame in said bolster opening, a spring seat block supported on said group and comprising an arcuate top surface, a bolster supported on said group and comprising a downwardly facing arcuate surface spaced above said first-mentioned surface, said bolster comprising interlocking means engaging said columns to afford an interlock therewith, and a leaf spring assembly supported on said block in engagement with said arcuate surfaces, each extremity of said assembly extending through the adjacent column opening and having an operative connection with the associated friction shoes.

6. In a railway car truck, a side frame comprising spaced columns defining spaced windows and an intermediate bolster opening, a friction device in each window comprising inboard and outboard friction panels mounted on said frame, spaced friction shoes engaging respective panels, and resilient means under compression between said shoes for urging the same into said engagement, a spring group on said frame in said bolster opening, a block supported on said group and comprising an arcuate top surface, a bolster supported on said group and comprising a downwardly facing arcuate surface spaced above said first-mentioned surface, and a leaf spring assembly supported on said block in engagement with said arcuate surfaces, each end of said assembly extending through the adjacent column and being slidably interlocked with the associated friction shoes for actuation thereof.

7. In a railway car truck, a side frame comprising spaced columns partly defining spaced windows and an intermediate bolster opening, friction devices carried by said frame in respective windows, resilient means on said frame in said opening, a bolster and spring seat block supported from said resilient means and comprising respectively spaced opposed arcuate surfaces, and a plurality of spring plates extending between said bolster and said block, the top plate bearing against said bolster surface and the bottom plate bearing against said block surface, said plates extending through openings in respective columns and having operative connections with said friction devices, each of said devices comprising inboard and outboard friction panels on said frame, friction shoes frictionally engaging respective panels and interlocked with said spring plates, and resilient means under compression between said shoes.

8. In a railway car truck, a side frame comprising spaced columns defining spaced windows and an intermediate bolster opening, said columns having openings therethrough aligned longitudinally of said frame, a friction device in each window, a spring group on said frame in said bolster opening, a block supported on said group and comprising an arcuate top surface, a bolster supported on said group and comprising a downwardly facing arcuate surface spaced above said first-mentioned surface, said bolster comprising integral interlocking means engaging said columns, and a leaf spring assembly supported on said block in engagement with said arcuate surfaces, each extremity of said assembly extending through the adjacent column opening and having an operative connection with the associated friction device.

9. In a railway car truck, a side frame comprising spaced columns partly defining spaced windows and an intermediate bolster opening, resilient means on said frame in said opening, a bolster supported from said resilient means, friction devices on said frame in respective windows, and a leaf spring assembly interposed between said bolster and said resilient means, each extremity of said assembly extending through the adjacent column and having an operative connection with the device therein, each of said devices comprising inboard and outboard friction surfaces on said frame, friction shoes resiliently urged against respective surfaces, and means on said shoes slidably interlocked with said assembly.

10. In a railway car truck, a side frame comprising spaced columns partly defining spaced windows and an intermediate bolster opening, spaced friction devices supported by said frame in respective windows, resilient means on said frame in said opening, a bolster and spring seat block supported from said resilient means and comprising respectively spaced opposed arcuate surfaces, and a plurality of spring plates extending between said bolster and said block, the top plate bearing against said bolster surface and the bottom plate bearing against said block surface, said plates extending through openings in respective columns and having operative connections with said friction devices.

11. In a railway car truck, a side frame comprising spaced columns partly defining spaced windows and an intermediate bolster opening, resilient means on said frame in said opening, a bolster supported from said resilient means, friction devices on said frame in respective windows, and a leaf spring assembly interposed between said bolster and said resilient means, each extremity of said assembly extending through the adjacent column and having an operative connection with the device therein, said bolster hav-

ing a downwardly facing arcuate surface bearing on said assembly.

12. In a railway car truck, a side frame comprising spaced columns partly defining spaced windows and an intermediate bolster opening, resilient means on said frame in said opening, a bolster supported from said resilient means, friction devices on said frame in respective windows, and a leaf spring assembly interposed between said bolster and said resilient means, each extremity of said assembly extending through the adjacent column and having an operative connection with the device therein.

13. In a railway car truck, a side frame, a friction device mounted thereon, a bolster resiliently supported from said frame, and an operative connection between said bolster and said device comprising a leaf spring assembly associated therewith, said device comprising spaced friction panels on said frame, friction elements resiliently urged into engagement with respective panels, and means on said elements interlocked with said assembly.

14. In a railway car truck, a side frame comprising spaced columns partly defining a bolster opening and spaced windows at opposite sides thereof, friction devices on said frame in respective windows, a bolster resiliently supported from said frame in said opening, and a leaf spring assembly extending longitudinally of the frame through said columns and operatively connected to respective devices, said assembly being operatively connected intermediate its ends to said bolster.

15. In a railway car truck, a side frame comprising spaced columns partly defining spaced windows and an intermediate bolster opening, friction devices mounted on said frame in said windows, a bolster resiliently supported from said frame in said opening, and flexible means carried by said bolster for vertical movement therewith, said flexible means being operatively connected to said devices.

16. In a railway car truck, a side frame comprising top and bottom members and spaced columns defining therewith a bolster opening and spaced windows at opposite sides thereof, spring means on said frame in said opening, a bolster supported by said spring means, friction means mounted on said frame in respective windows, said friction means comprising a pair of friction devices arranged and connected to each other so as to operate in series, one of the said devices being of relatively great capacity as compared with the other, said small capacity device extending through an opening in the associated column and being operatively connected to the bolster, and serving to dampen small oscillations of the bolster without actuating said large capacity device, said large capacity device being actuated by said small capacity device when large oscillations of the bolster occur beyond the operating limit of said small capacity device.

17. In a railway car truck, a side frame comprising top and bottom members and spaced columns defining therewith a bolster opening and spaced windows at opposite sides thereof, spring means on said frame in said opening, a bolster supported by said spring means, friction means comprising a pair of friction devices mounted on said frame in respective windows, openings through said columns, and an operative connection between said bolster and said devices comprising a friction device extending through said column openings, said last-mentioned device being of less capacity than said first-mentioned devices.

18. In a friction shoe, a member having a friction surface on the front face thereof, and a spring seat on the rear face thereof and a transverse slot in the rear face of said member above said seat, said slot presenting opposed top and bottom arcuate spring abutment surfaces.

19. In a railway car truck, a side frame comprising spaced columns and an intervening bolster opening, a bolster resiliently supported by said frame in said opening, friction means comprising an opening in at least one of said columns, a friction device mounted on said frame, and an operative connection between said bolster and said device comprising a leaf spring assembly connected therebetween and extending through said second-mentioned opening, said assembly including a plurality of abutting leaf springs formed and arranged to dampen relatively small oscillations of said bolster without actuating said device.

20. In a railway car truck, a side frame member including spaced columns, a bolster member resiliently supported from said frame member between said columns, a friction device carried by one of said members, and means operatively connecting the other member to said device for actuation thereof, said means comprising a leaf spring assembly extending through an opening in the associated column and including a plurality of interengaged leaf springs adapted to frictionally resist oscillations of the bolster member under certain operating conditions.

21. In a railway car truck, a side frame member, a bolster member resiliently supported therefrom, a friction device carried by one of said members, said device comprising spaced friction surfaces on its supporting member, friction shoes engaging respective surfaces, and resilient means for urging said shoes against said surfaces, and means operatively connecting the other member to said shoes for actuation thereof, said last-mentioned means comprising a leaf spring assembly.

22. In a railway car truck, a side frame comprising top and bottom members and spaced columns defining therewith a bolster opening and spaced windows at opposite sides thereof, spring means on said frame in said opening, a bolster supported by said spring means, friction means comprising a friction device mounted on said frame in one of said windows, an opening through the adjacent column, and means operatively connecting said bolster to said device for actuation thereof, said connecting means extending through said column opening and including means for developing friction independently of said device.

23. In a railway car truck, a side frame, a bolster spring-supported therefrom, a friction device carried by said frame, said device comprising a friction surface, a friction shoe movable thereagainst, and resilient means urging said shoe against said surface, and means operatively connecting said bolster to said shoe for actuation thereof, said connecting means comprising a leaf spring assembly.

24. In a railway car truck, a side frame member, a bolster member spring-supported therefrom, a friction device carried by one of said members, said device comprising a friction surface, a friction shoe movable thereagainst, resilient means urging said shoe against said surface, and means operatively connecting the other member to said shoe for actuation thereof.

said connecting means comprising a leaf spring assembly.

25. In a railway car truck, a supporting member including a column, a member resiliently supported from said supporting member and slidably interlocked with said column, a friction device carried by said supporting member and adapted to dampen oscillations of said supported member, and means operatively connecting said supported member to said device for actuation thereof, said means comprising a leaf spring assembly extending through an opening in said column and including a plurality of abutting leaf springs adapted to dampen relatively small oscillations of said supported member without actuating said device.

26. In a railway car truck, a supporting member, a member resiliently supported therefrom, a friction device carried by said supporting member and adapted to dampen oscillations of said supported member, and means operatively connecting said supported member to said device for actuation thereof, said means comprising means for dampening relatively small oscillations of said supported member without actuation of said device, said device comprising a pair of friction panels, friction shoes movable thereagainst, and resilient means for urging said shoes into engagement with said panels.

27. In a railway car truck, spaced side frames, a bolster extending between said frames and spring-supported therefrom, and friction means associated with each end of the bolster for dampening oscillations thereof, said means comprising spaced friction devices carried by the

associated side frame adjacent opposite ends thereof, and a leaf spring assembly extending longitudinally of said frame and connected between said bolster and devices for actuation of the latter, said devices and said assembly being so formed and arranged that relatively small bolster oscillations are dampened by said assembly without actuation of said devices.

28. In a railway car truck, spaced side frames, a bolster extending between said frames and spring-supported therefrom, and friction means associated with each end of the bolster for dampening oscillations thereof, said means comprising spaced friction devices carried by the associated side frame adjacent opposite ends thereof, and a leaf spring assembly extending longitudinally of said frame and connected between said bolster and devices for actuation of the latter, said devices and said assembly being so formed and arranged that relatively small bolster oscillations are dampened by said assembly without actuation of said devices, each of said devices including a friction panel, a friction shoe movable thereagainst, and resilient means for urging said shoe into engagement with said panel.

29. In a friction shoe, a member having a friction surface on the front face thereof and a spring seat on the rear face thereof, and a transverse slot in the rear face of said member vertically spaced with respect to said seat, said slot presenting opposed top and bottom abutment surfaces for cooperation with associated actuating means.

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