Nov. 6, 1951 C. L. ORR ET AL 2,574,348

DAMPING MEANS FOR RAILWAY TRUCKS

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Fig. 1

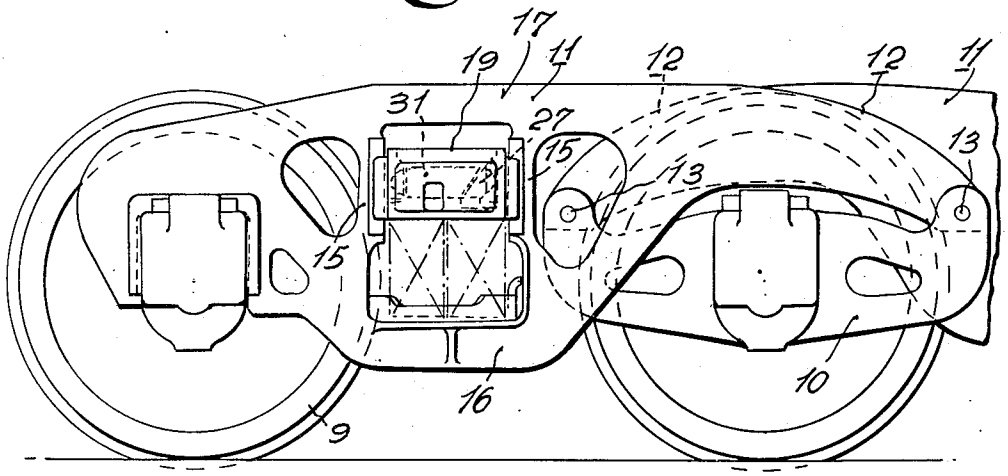
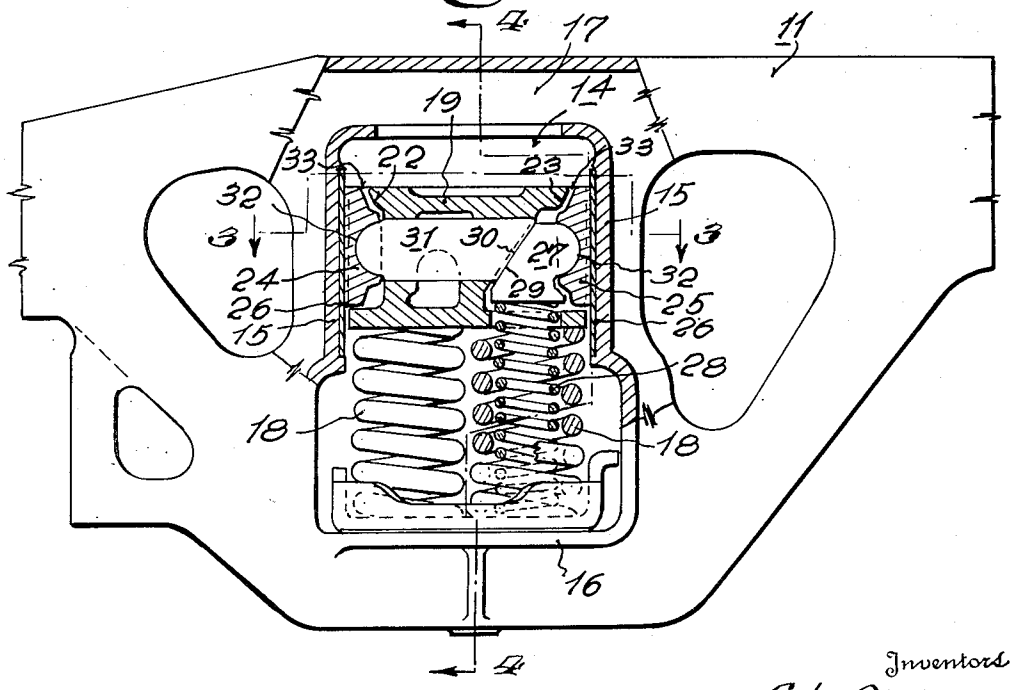


Fig. 2



Inventors
C. L. Orr,
J. C. Settles,

By Barry & Cyr
Attorneys

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Fig. 3

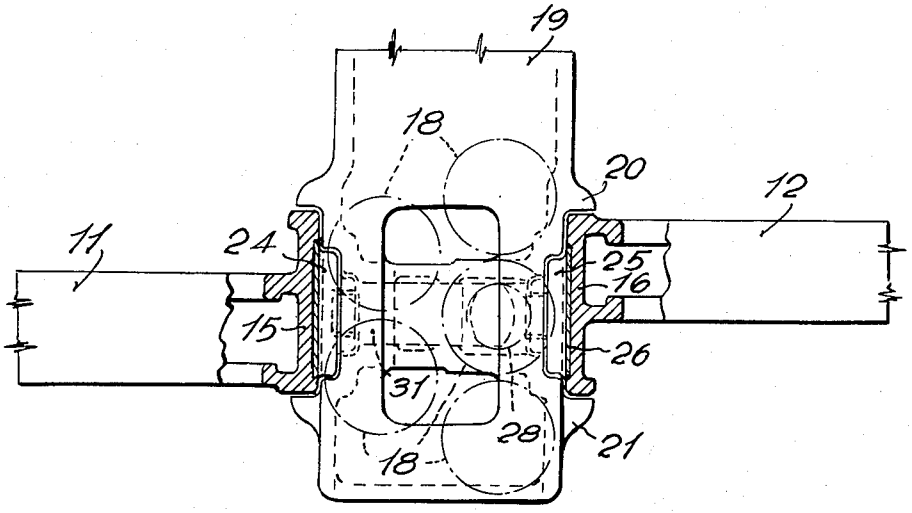
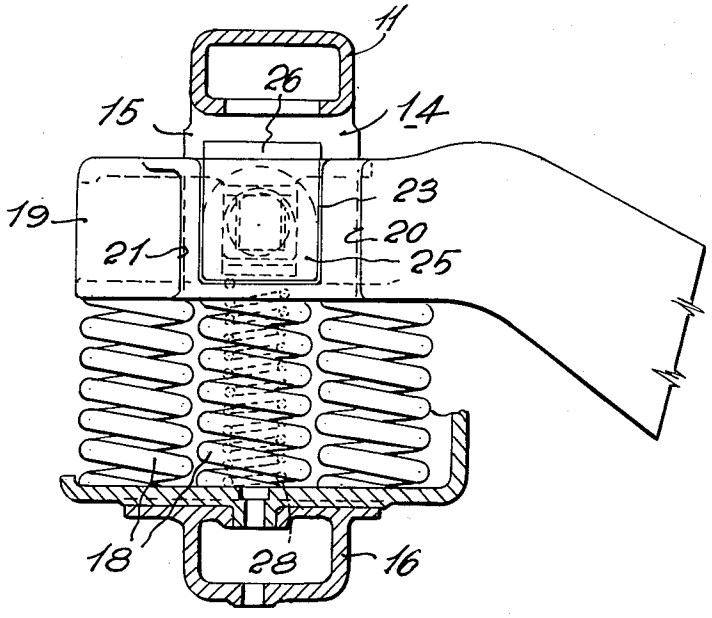


Fig. 4



Inventors
C. L. Orr,
J. C. Settles,

By Barry & Cyr
Attorneys

Nov. 6, 1951 C. L. ORR ET AL 2,574,348

DAMPING MEANS FOR RAILWAY TRUCKS

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Fig. 5

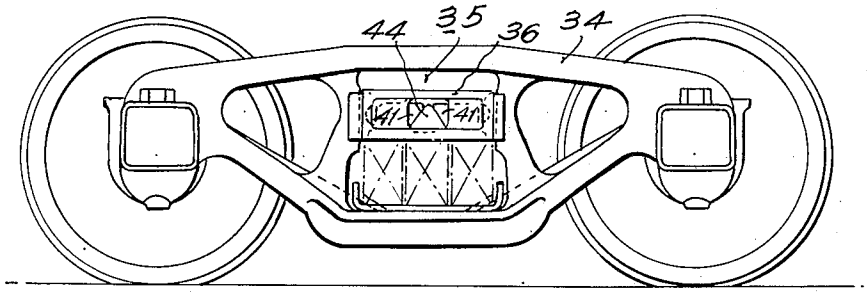


Fig. 9

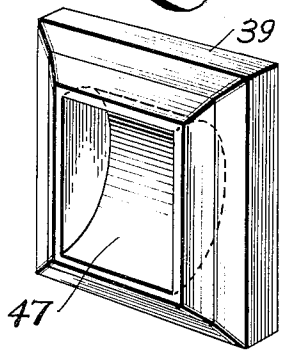
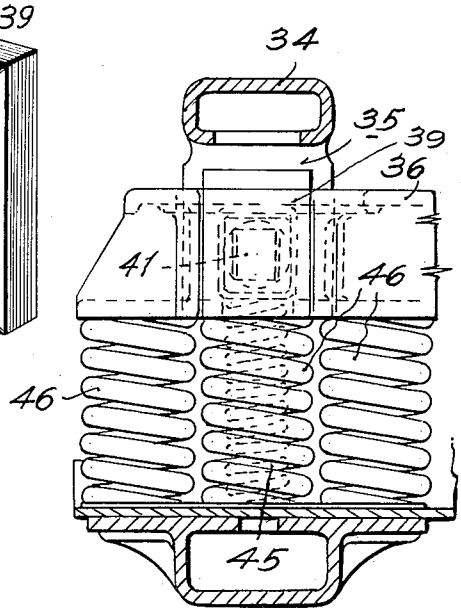


Fig. 8



Inventors

C. L. Orr,
J. C. Settles,

By Barry & Cyr Attorneys

Nov. 6, 1951 C. L. ORR ET AL 2,574,348

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Fig. 6

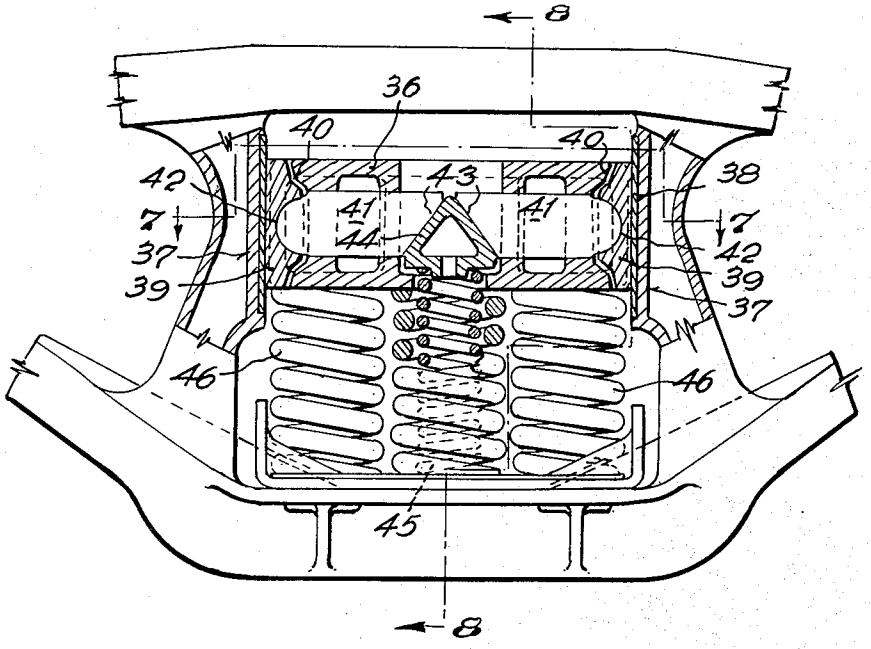
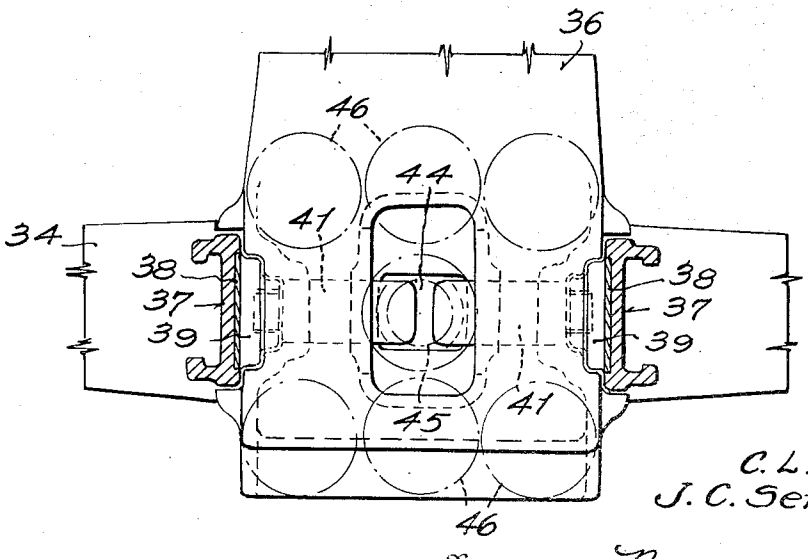


Fig. 7



Inventors
C. L. Orr,
J. C. Settles,
By Barry & Cyr
Attorneys

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UNITED STATES PATENT OFFICE

2,574,348

DAMPING MEANS FOR RAILWAY TRUCKS

Claude L. Orr and James C. Settles, Columbus, Ohio, assignors to The Buckeye Steel Castings Company, Columbus, Ohio

Application April 30, 1945, Serial No. 591,190

17 Claims. (Cl. 105—197)

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This invention relates to improvements in railway trucks, and more particularly to novel damping means for such trucks.

An object of the invention is to provide a damping means which can be actuated by at least one of the main load carrying coil springs of the truck.

Another object is to provide damping means adapted to produce frictional forces at the frame columns on both sides of the bolster opening and actuated by a single wedge member.

A further object is to provide a damping means for controlling the vertical motion of the bolster and which will not require the bolster to remain in a fixed position relative to the side frame in a direction longitudinally of the truck.

With the foregoing and various other objects in view, the invention may consist of certain novel features of construction and operation, as will be more fully described and particularly pointed out in the specification, drawings and claims appended hereto.

In the drawings, which illustrate embodiments of the device:

Figure 1 is a side elevation of a portion of a six wheel truck of the equalizer type and with one form of the invention incorporated therein.

Figure 2 is an enlarged fragmentary side elevation, partly in longitudinal vertical section, of a portion of the structure shown in Figure 1.

Figure 3 is a horizontal sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a transverse vertical sectional view taken on the line 4—4 of Figure 2.

Figure 5 is a side elevation of a four wheel truck with another form of the invention embodied therein.

Figure 6 is an enlarged fragmentary side elevation partly in longitudinal vertical section, of a portion of the structure shown in Figure 5.

Figure 7 is a transverse horizontal sectional view taken on the line 7—7 of Figure 6.

Figure 8 is a transverse vertical sectional view taken on the line 8—8 of Figure 6.

Figure 9 is a perspective view of one of the friction shoes.

Referring to Figures 1 to 4, inclusive, 9 designates wheels which support axles, not shown, carrying equalizers 10 and end frame members 11. Each end frame member is provided with a projecting horn 12 and the extremity of the horns are pivotally connected at 13 to the ends of the arms of the equalizer members 10.

As is customary in this type of truck, each of the end side frame members is provided

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with a bolster opening 14 defined by vertical columns 15, a spring seat 16 and a compression member 17. Supported by each spring seat is a group of main load carrying coil springs 18, and there are five springs in each group, three arranged at one side and two at the other. The bolster system of the truck has portions or arms 19 which extend through the bolster openings and rest on the springs, and each arm may have the usual inner lugs 20 and outer lugs 21 to abut against the inner and outer sides of the columns 15. All of the structure so far described is conventional, and in accordance with our invention opposite sides of each bolter arm are provided with recesses 22 and 23 for the reception of friction shoes 24 and 25, which slidably engage wear-plates 26 fixed to the confronting surfaces of the bolster guide columns. The shoe 25 is actuated by a wedge member 27 resting on the inner coil 28 of one of the load supporting springs, preferably the middle one of the three at one side of the bolster opening. The wedge 27 has an inclined side surface 29 sloping upwardly toward the shoe 25 and slidably engaging the complementary inclined surface 30 at one end of a thrust member 31, slidably mounted in the bolster arm for movement lengthwise of the truck. The members 27 and 31 are provided with substantially hemi-cylindrical surfaces 32 slidably engaging complementary surfaces at the inner sides of the shoes 24 and 25. As the hemi-cylindrical surfaces are struck from horizontal axes, it will be understood that each bolster arm can rock relative to the shoes with which it is associated so that the damping means will function while the bolster is at various angles relative to a side frame.

Clearances, as indicated at 33, between the bolster and the shoes of the damping device permit the bolster to float longitudinally of the truck with respect to the side frame without affecting the operation of the damping device. This feature is particularly advantageous in applications where the damping device is used with a six or eight wheel truck bolster of the type disclosed in the C. L. Orr application, Serial Number 566,988, in which the bolster system is formed as a single integral casting and the distance between the side frame column engaging portions of the bolster on the same side of the truck is held fixed by the integral construction.

It will be obvious from the foregoing that the construction illustrated in Figures 1 to 4,

inclusive, may be used with either a four wheel, six wheel or eight wheel truck.

The modification illustrated in Figures 5 to 8, inclusive, is shown embodied in a four wheel truck, and in this construction, each side frame 34 is provided with a bolster opening 35 through which an end of a bolster 36 extends. In this instance, the bolster is guided by side frame columns 37 provided with wear plates 38 which are frictionally engaged by shoes 39. Each shoe is provided with a substantially hemi-cylindrical shaped cavity 47. The latter extend into recesses 40 at opposite sides of the bolster and they cooperate with horizontally movable thrust members 41 slidably mounted in the bolster. One end of each thrust member and the shoe with which it is associated, is provided with a hemi-cylindrical surface 42, and the opposite end of each thrust member is provided with an inclined surface 43, which surfaces converge upwardly toward the center of the bolster. The inclined surfaces slidably engage a wedge 44 that rests on the inner coil 45 of one of the load supporting springs 46. In this form of the invention it will be obvious that the wedge 44 and inclined surfaces 43 will cause the thrust members 41 to push the friction shoes in opposite directions against the wear plates of the bolster guide columns.

In both forms of the invention, the bottom of the bolster is apertured for the reception of the spring on which the wedge rests and it is manifest that the structure illustrated in Figures 5 to 8, inclusive, may be used with either a four wheel, six wheel or eight wheel truck. The eight wheel truck may be of the type shown in the patent to Johnson et al., 2,235,214.

While we have disclosed what we now consider to be preferred embodiments of the invention in such manner that the same may be readily understood by those skilled in the art, we are aware that changes may be made in the details disclosed without departing from the spirit of the invention as expressed in the following claims.

What we claim and desire to secure by Letters Patent is:

1. In a railway car truck, a side frame member provided with bolster guide columns arranged at opposite sides of a bolster opening, load supporting spring means supported by the side frame member, a bolster having a portion extending into said opening and vertically guided by said columns, said bolster portion being supported by said spring means, friction shoes mounted in opposite sides of said bolster portion and slidably engaging said columns, and a wedge means for urging said shoes into frictional engagement with the columns, said wedge means including a wedge supported by said load supporting spring means, and a slidable thrust member movable substantially parallel to the side frame member.

2. In a railway car truck, a side frame member provided with bolster guide columns arranged at opposite sides of a bolster opening, load supporting spring means supported by the side frame member, a bolster having a portion extending into said opening and vertically guided by said columns, said bolster portion being directly supported by a part of said spring means, friction shoes mounted in opposite sides of said bolster portion and having outer sides slidably engaging said columns, and wedge means for urging said shoes into frictional engagement with said columns, said wedge means including a wedge arranged in said bolster portion, supported by another part of said load supporting spring means and operatively connected with the shoes, one of the shoes having a substantially hemi-cylindrical surface at the inner side thereof and the wedge means having a complementary surface in slidable contact therewith.

3. In damping means for railway trucks, a bolster, a friction shoe arranged at one side thereof, and means for urging the shoe away from the bolster, said means comprising a horizontally movable thrust member slidable transversely within the bolster, and complementary hemi-cylindrical surfaces on the shoe and thrust member, in slidable contact with one another and struck from a substantially horizontal axis.

4. In a railway car truck, a side frame member provided with bolster guide columns arranged at opposite sides of a bolster opening, load supporting spring means supported by the side frame member, a bolster having a portion extending into said opening and vertically guided by said columns, said bolster portion being supported by said spring means, friction shoes mounted in opposite sides of said bolster portion and engaging said columns, a wedge supported by said spring means, a thrust member interposed between one of the shoes and the wedge and actuated by the latter, and means operatively connecting the wedge and the other one of said shoes.

5. In a railway car truck, a side frame member provided with bolster guide columns arranged at opposite sides of a bolster opening, load supporting springs means supported by the side frame member, a bolster having a portion extending into said opening and vertically guided by said columns, said bolster portion being supported by said spring means, friction shoes mounted in opposite sides of said bolster portion and engaging said columns, a wedge supported by said spring means, a thrust member interposed between one of the shoes and the wedge and actuated by the latter, and means operatively connecting the wedge and the other one of said shoes, said thrust member and the last mentioned shoe being provided with contacting hemi-cylindrical surfaces.

6. In a railway car truck, a side frame member provided with bolster guide columns arranged at opposite sides of a bolster opening, load supporting spring means supported by the side frame member, a bolster having a portion extending into said opening and vertically guided by said columns, said bolster portion being supported by said spring means, friction shoes mounted in opposite sides of said bolster portion and engaging said columns, a wedge supported by said spring means, a thrust member interposed between one of the shoes and the wedge and actuated by the latter, and means operatively connecting the wedge and the other one of said shoes, said thrust member having a curved extremity and the last mentioned shoe having a curved surface complementary to and slidably engaging the curved extremity of the thrust member.

7. In a railway car truck, a side frame member provided with a bolster opening and guide columns, load supporting spring means supported by the side frame member, a bolster having a portion extending into said opening and vertically guided by said columns, said bolster portion being supported by said spring means, friction shoes mounted in opposite sides of said bolster portion and slidably engaging the columns, a wedge sup-

ported by said spring means and operatively connected with one of the shoes, and a thrust member actuated by the wedge and operatively connected to the other shoe.

8. In damping means for a railway car truck, a bolster arm, friction shoes arranged in opposite sides thereof with clearance between the shoes and bolster to permit relative rocking between them, each shoe being provided with a hemi-cylindrical inner surface, and wedge means for forcing the shoes away from one another and including members having hemi-cylindrical surfaces complementary to and slidably engaging the hemi-cylindrical surfaces of the shoe, one of said members being a thrust member arranged in and slidable horizontally and transversely of the bolster arm.

9. In a railway car truck, a side frame member provided with bolster guide columns arranged at opposite sides of a bolster opening, load supporting spring means supported by the side frame member, a bolster having a portion extending into said opening and vertically guided by the columns, said portion being supported by said spring means, friction shoes mounted in opposite sides of said bolster portion and slidably engaging said columns, a wedge, and thrust members interposed between the wedge and the shoes and actuated by the wedge for urging said shoes into frictional engagement with the columns, said wedge being supported by said spring means.

10. A railway truck as claimed in claim 11, in which the spring means includes inner and outer coils and the inner coil extends through the bottom of the bolster portion and supports the wedge.

11. In a railway truck, a side frame member provided with a bolster opening, load supporting spring means supported by the side frame member and including inner and outer coils, a bolster having a portion extending into said opening and vertically guided by the side frame member, said portion having a bottom resting on a part of said spring means, friction shoes mounted in opposite sides of said bolster portion and slidably engaging the side frame member, a wedge in said bolster portion supported by said inner coil of the spring means, and thrust members interposed between the wedge and the shoes and actuated by the wedge for urging said shoes into frictional engagement with the columns.

12. A railway car truck as claimed in claim 9, in which the thrust members and shoes are provided with contacting hemi-cylindrical surfaces struck from substantially horizontal axes.

13. In a railway car truck, a side frame member, guide columns carried by the side frame member providing a bolster opening therebetween, a bolster end portion having a top wall and a bottom wall extending into said bolster opening, springs supporting the end portion of the bolster on said side frame member, a friction shoe mounted at one side of the end portion of the bolster engaging one of the guide columns, said friction shoe having a concave cavity therein, a thrust member mounted between the top and bottom walls of the bolster end portion movable

transversely of the bolster, a convex end portion on said member engaging the friction shoe within said cavity, and resilient actuated wedge means urging said thrust member transversely of the bolster end portion towards the friction shoe.

14. In a damping mechanism for a railway truck, a bolster end portion having a top wall and a bottom wall, a friction shoe arranged at one side of the bolster end portion having a concave cavity therein, a thrust member slidable transversely within the bolster between the top and bottom walls, a convex end portion on said thrust member engaging said friction shoe within said cavity, and wedge means engaging the other end of the thrust member urging said thrust member transversely of the bolster end portion to move the friction shoe outwardly with respect to the side of the bolster.

15. A friction element for the damping means of a railway truck comprising, a shoe member, a flat surface on said member providing a vertical friction face, said member having a concave hemi-cylindrical open cavity in a side opposite the friction face struck from a generally horizontal axis, and a chord extending along diametrically opposite edges of said cavity being substantially parallel to said flat face.

16. In a damping mechanism for the bolster of a railway car truck, an elongated thrust member, a convex surface forming one end of said thrust member, a surface forming the opposite end of the thrust member inclined at an angle at less than ninety degrees with respect to the longitudinal axis of the thrust member, and said convex surface being symmetrical about said longitudinal axis.

17. In damping means for a railway truck, an elongated thrust member, a substantially hemi-cylindrical surface struck from an axis intersecting and at right angles to the longitudinal axis of the thrust member forming one end of said member, a substantially flat surface forming the opposite end of the thrust member, and said flat surface lying in a plane parallel to the axis of curvature of the hemi-cylindrical surface and inclined at an angle of less than ninety degrees with respect to the longitudinal axis of the thrust member.

CLAUDE L. ORR.
JAMES C. SETTLES.

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