Sept. 6, 1949. L. A. LEHRMAN 2,481,475

FRICTION DAMPED TRUCK

Filed June 15, 1945 2 Sheets-Sheet 1

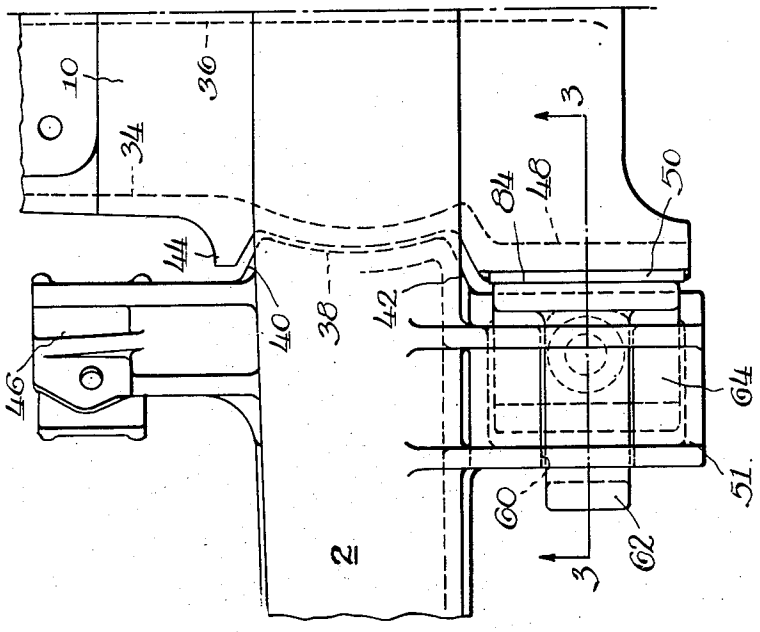


Fig. 2

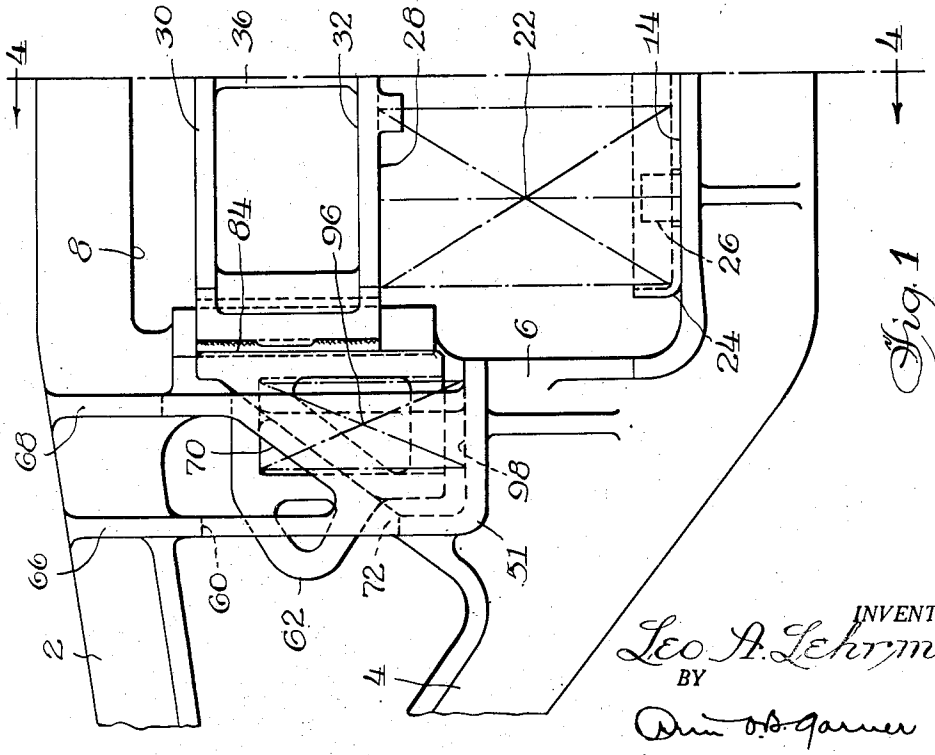


Fig. 1

INVENTOR.
Leo A. Lehrman
BY
Dan O. B. Garner
Atty.

Sept. 6, 1949. L. A. LEHRMAN 2,481,475

FRICTION DAMPED TRUCK

Filed June 15, 1945 2 Sheets-Sheet 2

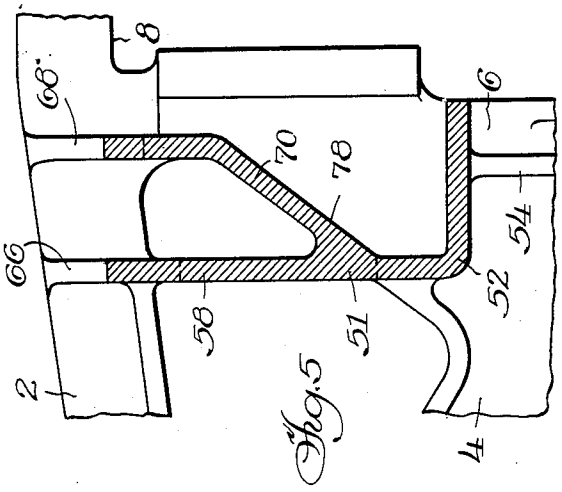


Fig. 5

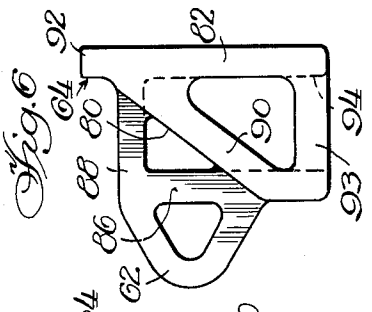


Fig. 6

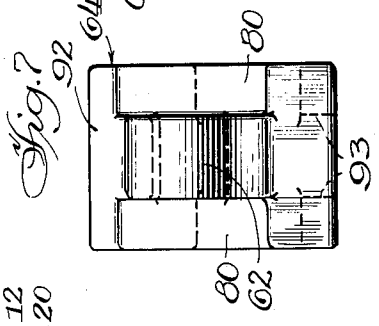


Fig. 7

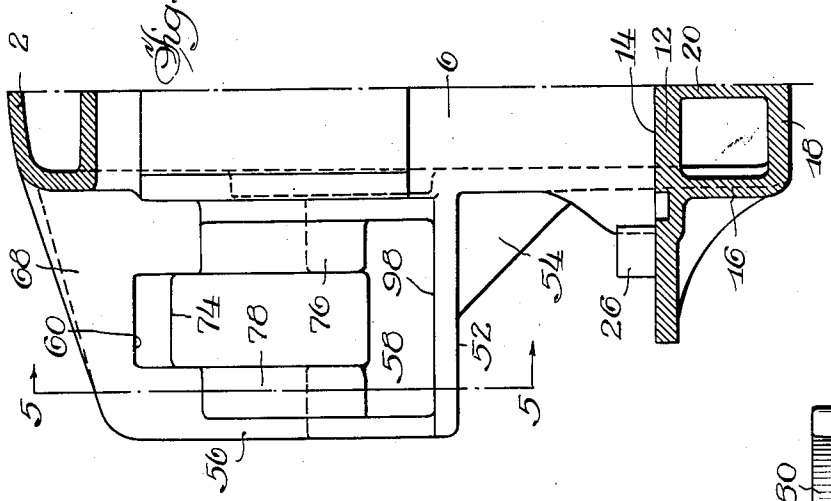


Fig. 4

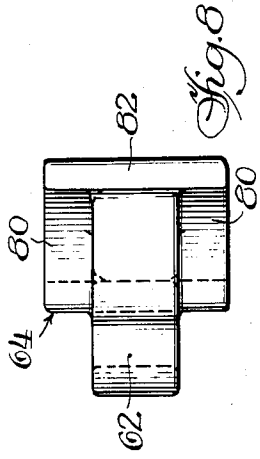


Fig. 8

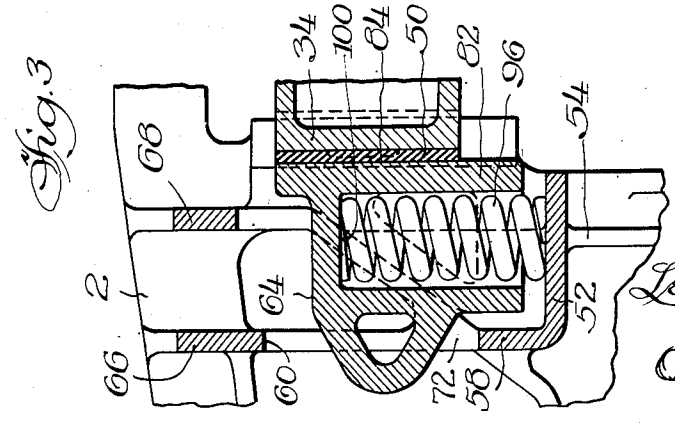


Fig. 3

INVENTOR.
Leo A. Lehrman
BY
Orin O. Garner
Atty.

Patented Sept. 6, 1949 2,481,475

UNITED STATES PATENT OFFICE

2,481,475

FRICTION DAMPED TRUCK

Leo A. Lehrman, Chicago, Ill., assignor to American Steel Foundries, Chicago, Ill., a corporation of New Jersey

Application June 15, 1945, Serial No. 599,543

9 Claims. (Cl. 105—197)

1

My invention relates to railway car trucks and, more particularly, to a four wheel freight car truck wherein a bolster is resiliently supported upon spaced side frames and friction means is so associated with the side frame and bolster structure as to control the action of the load supporting springs.

A specific object of my invention is to so devise such a railway car truck that the frictional control elements will be mounted at remotely spaced points at opposite sides of the car truck in order to secure the advantages inherent in such an arrangement. It is well known to those skilled in the art that the squaring effect of control means is increased for the same amount of energy absorption as the means of applying the energy is afforded a longer leverage. In my novel arrangement, I have so mounted the frictional control between the side frames and bolster as to secure maximum advantage.

Another object of my invention is to devise a novel form of side frame structure in which the ordinary truss type side frame is modified to provide a bracket on the outboard face of each column which may afford a housing for a friction absorbing device including a friction shoe and an associated actuating spring.

Still another object of my invention is to devise such a railway car truck wherein the friction elements are so mounted as to permit assembly and dismantling thereof in the side frame without removing the bolster end from the bolster opening of the side frame and, at the same time, permit inspection of all friction surfaces and ride control elements while the truck is fully assembled.

A different object of my invention is to provide such a four wheel railway car truck as above indicated in which spaced side frames may be afforded outboard friction means for cooperation with the extremities of a bolster spring-supported from said side frames.

In the drawings:

Figure 1 is a fragmentary side elevation of a railway car truck embodying my invention.

Figure 2 is a fragmentary top plan view of the railway car truck illustrated in Figure 1.

Figure 3 is a fragmentary sectional view in a vertical longitudinal plane through the truck structure shown in Figures 1 and 2, the section being taken approximately as indicated by the line 3—3 of Figure 2.

Figure 4 is a sectional view through my novel side frame structure, the section being taken approximately in the transverse vertical plane bisecting the frame as indicated by the line 4—4 of

2

Figure 1, the bolster, of course, being omitted from the showing in Figure 4.

Figure 5 is a fragmentary sectional view through the side frame bracket housing the friction device, the section being taken approximately in the longitudinal vertical plane indicated by the line 5—5 of Figure 4.

Figures 6, 7, and 8 show my novel form of friction shoe, Figure 6 being a side elevation thereof, Figure 7 an elevational view taken from the left as seen in Figure 6, and Figure 8 a top plan view thereof.

My novel arrangement is shown as applied to a four wheel railway freight car truck more or less conventional in form in which a truss type side frame is used, said side frame having a compression member 2, a tension member 4, and the usual column 6 at each side of the bolster opening 8 within which may be received the end portion of the bolster generally designated 10. The tension member 4 between the columns 6, 6 may be of box-section with a widened top chord 12 affording a spring seat at 14, said box-section also comprising the side wall 16, the bottom wall 18, and the center rib 20 (Figure 4). On the spring seat 14 may be supported a plurality of coil springs diagrammatically indicated at 22, said springs as illustrated in Figure 1 being seated on the bottom spring plate 24 and said plate being interlocked with the side frame by the usual dowel means 26. The upper end of the springs 22, 22 afford a seat as at 28 for the bottom of the bolster 10, said bolster being of box-section with the top wall 30, the bottom wall 32, the side wall 34, and the longitudinal center rib 36.

The upper portion of each column 6 may have bolster guide means of well-known form comprising a substantially vertical concave cylindrical face 38 merging at the inboard and outboard edges thereof with diagonal faces 40 and 42 (Figure 2) and affording cooperation with complementary cylindrical and diagonal faces on the adjacent bolster side wall. Inboard each column, each bolster side wall is afforded a guide lug 44 adjacent the usual brake hanger bracket 46, and outboard the column the bolster side wall 34 is extended to form a friction wall 48, on the outer face of which may be supported the wear plate 50.

As already indicated, a bracket housing generally designated 51 may be integrally formed on the outboard face of each column 6, said bracket having a substantially horizontal bottom wall 52, the reinforcing gusset 54 therebelow, an outboard wall 56 (Figure 4), and a rear wall 58 having a vertical slot 60 through which may project the handle-like

loop portion 62 of the friction shoe generally designated 64. The rear wall 58 may continue upwardly in the reinforcing gusset 66, merging with the compression member above said bracket, and a substantially parallel vertical gusset 68 may also be formed above said bracket. The gusset 68 may continue downwardly into the diagonal wall 70, said diagonal wall merging with the rear wall 58 at a point 72 adjacent the lower end of the bracket, as well seen in Figure 1. The diagonal wall 70 is also formed with an elongated slot 74 in alignment with the before-mentioned slot 60, as well seen in Figure 4. At opposite sides of the slot 74 in the diagonal wall 70 may be formed inboard and outboard friction surfaces 76 and 78 affording bearing for the diagonal surfaces 80, 80 at opposite sides of the enclosed friction shoe.

Each friction shoe may have a substantially rectangular vertical friction wall 82 which may have flat face engagement as at 84 with the adjacent bolster friction wear plate 50. The friction shoe 64 may be a cup-shaped structure with the before-mentioned vertical friction wall 82, the rear wall 86, the handle or loop portion 62, the top wall 88, and the diagonal walls 90, 90 at opposite sides of the loop 62, the upper faces of said diagonal walls 90, 90 affording the before-mentioned diagonal seats 80, 80 where the shoe may bear against complementary faces on the wall 70 of the bracket housing 51. The friction wall 82 may extend as at 92 above the top wall 88 in order to afford added wearing areas on the bolster engaging face. The friction shoe 64 may be cored away at the sides except for the tie bars 93, 93 adjacent the bottom edge, and the bottom may be left open, said bottom opening 94 accommodating the insertion within said shoe of the shoe actuating spring 96, the bottom of said spring being seated as at 98 on the bottom wall 52 of the bracket housing 51, and the upper end of said spring being afforded a seat as at 100 (Figure 3) against the top wall 88 of the friction shoe so that said compression spring 96 is effective to urge the friction shoe against the diagonal wall 70 of the housing bracket along which it may have limited sliding movement and be urged into engagement as at 84 with the adjacent bolster wear plate. It will be understood, of course, that as the bolster end moves laterally in the bolster opening of the side frame each friction shoe in the housing of the respective column will slide along the diagonal wall 70, and the spring 96 will be always under sufficient compression to maintain each friction shoe tightly in engagement with the wall 70, as well as with the adjacent side wall of the bolster.

The loop or handle-like portion on each friction shoe affords a means of engaging a pinch bar or the like for moving the shoe out of engagement with the bolster or for maintaining the shoe in such position during assembly or dismantling operations, as will be readily understood by those skilled in the art. When it is desired, for example, to replace worn shoes, each shoe may be wedged downwardly and a securing pin inserted in the loop 62 of each shoe, thus retaining the shoe in such depressed position where it is free of the bolster. The bolster supporting springs may then be removed, permitting the bolster to rest on the tension member of the frame, after which the worn shoes may be replaced by new ones. Subsequently, the bolster may be elevated to its normal position and the supporting springs replaced.

It will thus be seen that my novel arrangement affords definite control of movements of the bolster end longitudinally of the side frame and, at the same time, affords maximum squaring effect by providing friction control at the extremities of the bolster, both of which results are obtained while a substantially constant frictional force is operative to snub the load springs on which the bolster may be supported from the side frame. Any out-of-square movement of the bolster with respect to the side frame which may be induced by normal operating conditions will be opposed by my novel arrangement, and the return to normal position will be induced by the unbalance of forces at opposite sides of each bolster end when such out-of-squareness takes place.

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 form the spirit of the invention or the scope of the claims.

I claim:

1. In a railway car truck, spaced side frames with tension and compression members and vertical columns defining bolster openings, vertical cylindrical portions on said columns, a bolster spring-supported on said tension members in said openings with complementary faces engaging said portions, plane friction faces on each side of said bolster outboard said columns, integral housings on said columns confining friction shoes for engagement with said faces, each of said friction shoes having slidable abutment along spaced aligned surfaces of a wall of the adjacent housing and having a surface engaging the adjacent friction face, and resilient means associated with each shoe for urging it into engagement with the adjacent housing wall and friction face, each resilient means being housed within the associated shoe and projecting therefrom for abutment with another wall of the adjacent housing, aligned slots in said diagonal wall and in a wall of said bracket remote from said bolster opening, said resilient means being positioned in said shoe in the plane defined by said aligned openings.

2. In a railway car truck, a side frame of truss type comprising tension and compression members and spaced columns defining a bolster opening, a bracket integrally formed on the outboard face of each column in the form of a housing for associated friction means, said housing having a bottom wall defining a spring seat, a wall remote from said opening with a vertical slot therein, and a diagonal wall with a slot aligned with said first-mentioned slot, said aligned slots accommodating a portion of an associated friction shoe and said seat affording an abutment for an associated spring in the vertical planes defined by said slots, said diagonal wall affording a plurality of seats for said shoe within said housing.

3. In a railway car truck, spaced side frames with tension and compression members and vertical columns defining bolster openings, vertical cylindrical portions on said columns, a bolster spring-supported on said tension members in said openings with complementary faces engaging said portions, plane friction faces on each side of said bolster outboard said columns, integral housings on said columns confining friction shoes for engagement with said faces, each of said friction shoes having slidable abutment along spaced aligned surfaces of a wall of the adjacent housing and having a surface engaging the adjacent friction face, and resilient means

associated with each shoe for urging it into engagement with the adjacent housing wall and friction face, said aligned surfaces being spaced at opposite sides of an opening in the associated wall and said last-mentioned opening being aligned with an opening of corresponding width in an adjoining wall of the housing for accommodation of a portion of the associated friction shoe.

4. In a railway car truck, a side frame of truss type comprising tension and compression members and spaced columns defining a bolster opening, a bracket integrally formed on the outboard face of each column in the form of a housing for associated friction means, said housing having a bottom wall defining a spring seat, a wall remote from said opening with a vertical slot therein, and a diagonal wall with a slot aligned with said first-mentioned slot, said aligned slots accommodating a portion of an associated friction shoe and said seat affording an abutment for an associated spring in the vertical planes defined by said slots.

5. In a railway car truck, a side frame of truss type comprising tension and compression members and spaced columns defining a bolster opening, a bracket integrally formed on the outboard face of each column in the form of a housing for associated friction means, said housing having a bottom wall defining a spring seat, a wall remote from said opening with a vertical slot therein, and a diagonal wall with a slot aligned with said first-mentioned slot, said diagonal wall having aligned friction surfaces at opposite sides of the slot therein and said bracket having spaced parallel gussets extending thereabove and merging with the side wall of the compression member of said frame.

6. In a railway car truck, a side frame of truss type comprising tension and compression members and spaced columns defining a bolster opening, a bracket integrally formed on the outboard face of each column in the form of a housing for associated friction means, said housing having a bottom wall defining a spring seat, a wall remote from said opening with a vertical slot therein, and a diagonal wall with a slot aligned with said first-mentioned slot, said aligned slots accommodating a portion of an associated friction shoe and said seat affording an abutment for an associated spring in the vertical planes defined by said slots, said diagonal wall affording a plurality of seats for said shoe within said housing, each of said housings having spaced vertical walls extending transversely of said truck and merging with the compression member of the side frame thereadjacent.

7. In a railway car truck, a side frame of truss type comprising tension and compression members and spaced columns defining a bolster opening, a bracket integrally formed on the outboard face of each column in the form of a housing for associated friction means, said housing having a bottom wall defining a spring seat, a wall remote from said opening with a vertical slot therein, and a diagonal wall with a slot aligned with said first-mentioned slot, said aligned slots accommodating a portion of an associated friction shoe and said seat affording an abutment for an associated spring in the vertical planes

defined by said slots, each of said diagonal walls merging with spaced vertical walls of the associated housing and said spaced vertical walls being extended to merge with the compression member thereabove.

8. A side frame and friction shoe assembly comprising a truss type side frame having tension and compression members and spaced columns defining a central opening, housings on one side of said frame, one on each of said columns, each housing having a substantially vertical wall remote from said opening with a vertical slot therein, a bottom wall defining a spring seat, and a diagonal wall merging with said first-named wall adjacent the bottom thereof and sloping upwardly toward said opening, a slot in said diagonal wall in alignment with said vertical slot longitudinally of said frame, and friction means in each housing comprising a friction shoe and an actuating spring therefor, the slots in said diagonal and vertical walls accommodating a portion of the associated shoe, each spring being substantially vertically disposed and seating at one end against the associated spring seat and at the other end against the associated shoe for urging the latter upwardly against the respective diagonal wall and along the same outwardly of the associated housing toward said opening.

9. In a railway car truck, a side frame of truss type comprising tension and compression members and spaced columns defining a bolster opening substantially centrally of said frame and spaced window openings adjacent opposite ends of said frame, housings on one side of said frame, one on each column, for enclosing associated friction means, each housing having a vertical wall merging with the associated sides of the compression member and related column adjacent the respective window opening, a bottom wall merging with said vertical wall and adjacent side of the related column, a side wall spaced from the related column and merging with the outer edges of said vertical and bottom walls, a diagonal wall merging with the upper edge of said side wall and with the adjacent side of the related column and with said vertical wall adjacent the lower end thereof, and a gusset depending from said bottom wall and merging with the related column, said diagonal wall sloping upwardly toward said opening and having a vertical slot aligned with a slot in the vertical wall, said aligned slots being adapted to receive a portion of an associated friction shoe and said seat affording an abutment for an associated spring in the planes defined by said slots.

LEO A. LEHRMAN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
716,294	Shallenberger	Dec. 16, 1902
1,414,958	Kadel	May 2, 1922
2,084,028	Hedgecock	June 15, 1937
2,295,549	Cottrell	Sept. 15, 1942
2,346,614	Rydin	Apr. 11, 1944
2,378,414	Light	June 19, 1945