March 13, 1956 A. O. WILLIAMS 2,737,908

RAIL CAR TRUCK

Filed Sept. 13, 1951

FIG. 1

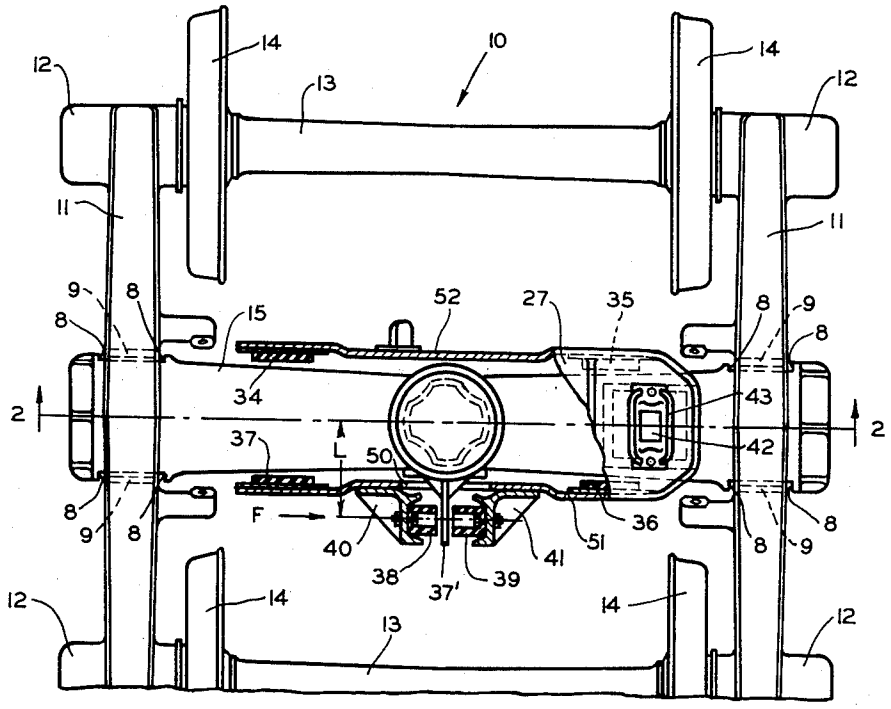
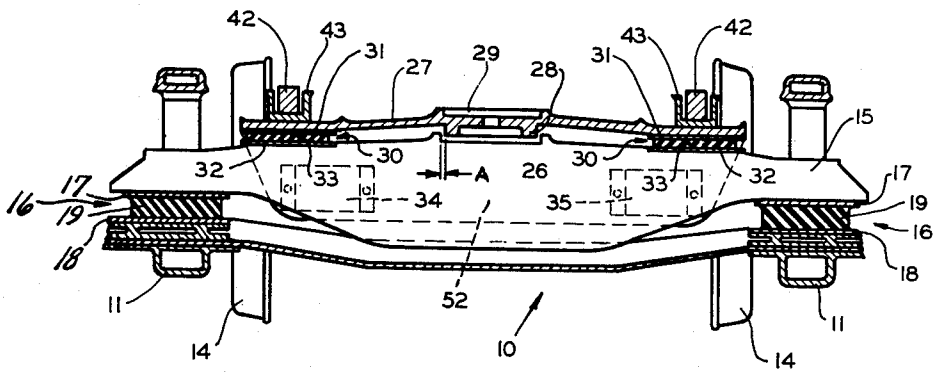


FIG. 2



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RAIL CAR TRUCK

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9 Claims. (Cl. 105—227)

My invention relates generally to rail car trucks, and, more specifically, is directed to a bolster assembly for rail car trucks.

Present rail car trucks with which I am familiar generally comprise a pair of main side frame members which are supported at their ends on suitable axle and wheel assemblies. Extending transversely of the main side frame members is a bolster which at its ends is mounted on the side frame members through swing links of known construction. The swing links are provided in order that the rail car truck can move sidewise relative to the bolster and the car body supported thereon. Swing links are objectionable in that they occupy considerable space and, further, since numerous bearing supports are required, the swing links are costly to fabricate and assemble in a rail car truck. A still further undesirable feature of the swing link suspension is that movement between the truck and bolster is relatively unrestrained. It has been suggested that rubber bumper means be disposed adjacent the ends of the bolster and mounted on the truck frame for limiting endwise movement of the bolster and car body.

It is an object of my present invention to provide a simple and compact bolster assembly which avoids the aforementioned and other disadvantages of the known swing links, and which provides improved cushioning characteristics of endwise movement of the bolster and car body of presently known constructions.

It is another object of my present invention to provide a bolster assembly comprising a bolster, a bolster saddle resiliently supported thereon for supporting a car body, and guide means on the bolster saddle for limiting lateral or sidewise movement of the bolster saddle relative to the bolster.

It is still another object of my present invention to provide a bolster assembly comprising a bolster, a bolster saddle resiliently supported thereon for supporting a car body, and means between the bolster and bolster saddle which will offer an increasing rate of resistance to endwise movement of the bolster saddle relative to the bolster as the extent of such endwise movement increases.

I propose to accomplish the aforementioned object by providing the bolster saddle with resilient means, preferably in the form of block members adjacent the corners thereof with the resilient means at one pair of diagonal corners of the bolster saddle being adapted to frictionally engage the sides of the bolster upon initial endwise movement of the bolster saddle longitudinally of the bolster for resisting further movement of the bolster saddle longitudinally of the bolster.

It is a further object of my present invention to provide means between the bolster and bolster saddle which will translate endwise movement of the bolster saddle relative to the bolster into rotational movement.

To accomplish this object, I secure a vertical laterally extending flange plate to the bolster intermediate of the ends thereof. I also secure resilient blocks to the bolster saddle adjacent opposite sides of the flange plate. Upon initial endwise movement of the bolster saddle longitudinally of the bolster, one of the resilient blocks engages the flange plate causing the bolster saddle to rotate. This rotational movement urges the aforementioned resilient block members at one pair of diagonal corners of the bolster saddle into frictional engagement with the bolster for resisting further movement of the bolster saddle longitudinally of the bolster.

It is a further object of my present invention to provide a rail car truck comprising a bolster assembly of the character described wherein resilient sandwich members are disposed at the ends of the bolster and are secured at their lower surfaces to the main side frame members of the truck and at their upper surfaces to the bolster for normally maintaining the bolster at right angles relative to the main side frame members.

It is a still further object of my present invention to provide a rail car truck comprising a bolster assembly of the character described which may be interchangeably mounted beneath any standard rail car.

Now, in order to acquaint those skilled in the art with the manner of constructing and using the devices of my present invention, I shall describe in connection with the accompanying drawing a preferred embodiment of my invention.

In the drawings:

Figure 1 is a partial plan view of the rail car truck of my present invention with a portion of the bolster saddle being broken away for the sake of clarity; and

Figure 2 is a vertical sectional view of the rail car truck of Figure 1 taken substantially along the line 2—2 of Figure 1.

Referring now to the drawing, there is indicated generally by the reference numeral 10 a rail car truck comprising parallel spaced apart main side frame members 11. Conventional journal boxes 12 are fixed at the ends of the main side frame members 11 and the journal boxes 12 receive the ends of axles 13, on which conventional flanged rail wheels 14 are suitably secured.

The main side frame members 11 are provided with vertically extending spaced apart flange members 9 which define central openings for receiving the ends of a truck bolster 15 which extends transversely of the rail car truck 10. The truck bolster 15 at each side adjacent the ends thereof is formed with shoulders 8. The flange members 9 serve as guide means and limit lateral or sidewise movement of the bolster 15 relative to the side frame members 11, and the shoulders 8 limit endwise movement of the bolster 15 relative to the side frame members 11 and maintain the side frame members 11 in proper spaced relation. The ends of the truck bolster 15 are preferably supported on the main side frame members 11 by means of resilient sandwich members which are indicated generally by the reference numerals 16. Each resilient sandwich member 16 comprises a pair of vertically spaced metallic plate members 17 and 18, which are respectively vulcanized to the upper and lower surfaces of an intermediate rubber element 19. The upper metallic plate member 17 is suitably secured to the underside of the truck bolster 15 and the lower metallic plate member 18 is suitably secured to the main side frame member 11.

The resilient sandwich members 16 tend to maintain the truck bolster 15 at right angles relative to the main side frame members 11. Any tendency of the truck bolster 15 to angle relative to the main side frame members 11 causes the rubber elements 19 to deflect torsionally about their vertical axes.

The truck bolster 15 is formed centrally of the ends thereof with a conventional king pin seat 25.

Extending transversely of the rail car truck 10 and over-

lying the truck bolster 15 is an inverted substantially U-shaped bolster saddle member 27 having guide means comprising a pair of vertically downwardly depending legs 51 and 52. The guide means are provided for limiting lateral or sidewise movement of the bolster saddle 27 relative to the bolster 15. The bolster saddle 27 has formed on the underside of the bight portion thereof, a projection 28 which is received in the aforementioned king pin seat 26 of the truck bolster 15. The projection 28 is provided for limiting endwise movement of the bolster saddle 27 longitudinally of the truck bolster 15. Relative movement between the bolster saddle 27 and the bolster 15 may be varied by varying the distance A as indicated in Figure 2. The upper surface of the bolster saddle 27 is formed with a king pin seat 29 which is adapted to receive the king pin of a car body. An opening 50 may be formed in the vertical leg 51 of the bolster saddle 27 for a purpose to be hereinafter described.

Interposed between the ends of the bolster saddle 27 and the truck bolster 15 are resilient sandwich members 30 which comprise upper plate members 31 suitably secured to the underside of the bolster saddle 27 and the lower plate members 32 suitably secured to the upper surface of the truck bolster 15. Suitably vulcanized between the associated upper and lower plate members 31 and 32 are rubber elements 33. Limited endwise movement of the bolster saddle 27 longitudinally of the truck bolster 15 is permitted through shear displacement of the rubber elements 33 of the resilient sandwich members 30.

In the preferred form of my invention, frictional block members 34, 35, 36, and 37, are suitably secured to the guide means of vertical legs 51 and 52 of the inverted U-shaped bolster saddle 27 at the ends thereof and face the sides of the truck bolster 15. The block members 34, 35, 36, and 37 are preferably formed of rubber but the block members may be formed of other suitable friction material. The block members are adapted to frictionally engage the sides of the bolster 15 upon initial endwise movement of the bolster saddle 27 longitudinally of the bolster 15 for resisting further endwise movement of the bolster saddle 27 longitudinally of the bolster 15.

In order to positively urge the block members 34, 35, 36, or 37 into frictional engagement with the sides of the bolster 15, I propose to provide means for translating endwise movement of the bolster saddle 27 longitudinally of the bolster 15 into rotational movement. Such means comprises a vertical laterally extending flange plate 37' which is secured to the bolster 15 and extends through the opening 50 in the vertical leg 51 of the inverted U-shaped bolster saddle 27, as shown in Figure 1. Disposed on each side of the flange plate 37' are resilient members 38 and 39 which are preferably cup-shaped and formed of rubber. Coil springs may be employed in place of the resilient members 38 and 39. The resilient members 38 and 39 are bolted to angle flange members 40 and 41 which in turn are suitably secured to the adjacent vertical leg 51 of the bolster saddle 27.

Upon initial endwise movement of the bolster saddle 27 longitudinally of the bolster 15 to the left as viewed in Figure 1, the resilient member 39 will engage the adjacent side of the flange plate 37' thereby causing the bolster saddle 27 to rotate counterclockwise as viewed in Figure 1. The resisting moment thus set up, which is equal to the force F, resisting endwise movement of the bolster saddle 27, multiplied by the lever arm L, will cause the block members 34 and 36 to be disposed into frictional engagement with the sides of the bolster 15. Upon further endwise movement of the bolster saddle 27 relative to the bolster 15, the resisting force F increases thereby increasing the resisting moment and the force with which the block members 34 and 36 are urged into engagement with the sides of the bolster 15. It will be apparent that as the force urging the block members 34 and 36 into frictional engagement with the sides of the bolster 15 increases, the resistance offered to endwise movement of the bolster saddle 27 will increase. It will thus be seen that the block members 34 and 36 will offer an increasing rate of resistance to endwise movement of the bolster saddle 27 relative to the bolster 15, as the extent of such endwise movement increases.

Upon initial endwise movement of the bolster saddle 27 longitudinally of the bolster 15 to the right, as viewed in Figure 1, the resilient member 38 will engage the adjacent side of the flange plate 37' setting up a resisting moment in the opposite direction to that described above. The bolster saddle 27 will thus be caused to rotate clockwise as viewed in Figure 1, thereby urging the block members 35 and 37 into frictional engagement with the sides of the bolster 15. Further endwise movement of the bolster saddle 27 increases the resisting moment and the force with which the block members 35 and 37 are urged into frictional engagement with the sides of the bolster 15. It will thus be seen that the block members 35 and 37 will, in the same manner as block members 34 and 36, offer an increasing rate of resistance to endwise movement of the bolster saddle 27 relative to the bolster 15, as the extent of such endwise movement increases. The snubbing action between the block members and the bolster 15, during movement of the bolster saddle 27 away from mid-position, serves to dissipate energy, in the form of heat, so that the energy remaining for returning the bolster saddle to mid-position is reduced. During return movement of the bolster saddle 27 to mid-position there will be some frictional snubbing between the block members and the bolster 15 and thus further energy is dissipated.

In certain applications of my invention, it may be desired that small endwise movements of the bolster saddle 27 be unrestrained. To permit such unrestrained movement, predetermined spacing may be provided between the ends of the resilient members 38 and 39 and the adjacent surfaces of the flange 37'. The degree of spacing between the ends of the resilient members 38 and 39 and the adjacent surfaces of the flange 37' may be varied in order that the characteristics of the rotational means may be varied as will be understood by those skilled in the art.

From the foregoing description it will be seen that I have provided a simple and compact bolster assembly which avoids the disadvantages of conventional swing link suspensions, but incorporates its advantages and in addition provides improved snubbing characteristics of endwise movement of the car body supported thereon.

Conventional side bearing members indicated at 42 are disposed in retaining members 43 suitably secured as by bolts to the upper surface of the bolster saddle 27 adjacent the ends thereof. Since the bolster saddle 27 is provided with conventional bearing members 42 adjacent the ends thereof and with a king pin seat 29 centrally thereof, it will be seen that the rail car truck of my present invention may be interchangeably mounted beneath any standard rail car.

While I have shown and described what I believe to be a preferred embodiment of my present invention, it will be understood that various modifications and rearrangements may be made therein without departing from the spirit and scope of my present invention.

I claim:

1. In a rail car truck, the combination of a bolster, a bolster saddle resiliently mounted on said bolster, frictional means carried by said bolster saddle and adapted to engage the sides of said bolster, and means between said bolster and said bolster saddle for translating movement of the latter longitudinally of said bolster into rotational movement whereby at least one of said frictional means is forced into frictional engagement with said bolster for resisting further movement of said bolster saddle longitudinally of said bolster.

2. In a rail car truck, the combination of a bolster, a bolster saddle overlying said bolster, resilient means for supporting said bolster saddle on said bolster, frictional means carried by said bolster saddle at the corners

thereof and adapted to engage the sides of said bolster, and means between said bolster and said bolster saddle for translating relative movement of the latter longitudinally of said bolster into rotational movement whereby said frictional means at one pair of diagonal corners of said bolster saddle are forced into frictional engagement with said bolster for resisting further movement of said bolster saddle longitudinally of said bolster.

3. In a rail car truck, the combination of a bolster, a bolster saddle overlying said bolster, resilient sandwich members at the ends of said bolster saddle secured at their lower surfaces to said bolster and at their upper surfaces to said bolster saddle, frictional block members carried by the vertical legs of said bolster saddle adjacent the ends thereof and facing the sides of said bolster, and means between said bolster and said bolster saddle for translating relative movement of the latter longitudinally of said bolster into rotational movement whereby said frictional block members at one pair of diagonal corners of said bolster saddle are forced into frictional engagement with said bolster for resisting further movement of said bolster saddle longitudinally of said bolster.

4. In a rail car truck, the combination of a bolster, a bolster saddle resiliently mounted on said bolster, a vertical laterally extending flange plate carried by said bolster intermediate the ends thereof, and resilient means adjacent opposite sides of said flange plate and carried by said bolster saddle whereby upon relative movement of said bolster saddle longitudinally of said bolster one of said resilient means engages said flange plate causing said bolster saddle to rotate thereby translating longitudinal movement of said bolster saddle into rotational movement.

5. In a rail car truck, the combination of a bolster, a bolster saddle overlying said bolster, resilient sandwich members at the ends of said bolster saddle secured at their lower surfaces to said bolster and at their upper surfaces to said bolster saddle, frictional block members carried by said bolster saddle adjacent the ends thereof and facing the sides of said bolster, a vertical laterally extending flange plate carried by said bolster intermediate the ends thereof, resilient means adjacent opposite sides of said flange plate and carried by said bolster saddle whereby upon relative movement of said bolster saddle longitudinally of said bolster, one of said resilient means engages said flange plate causing said bolster saddle to rotate thereby forcing said frictional block members at one pair of diagonal corners of said bolster saddle into frictional engagement with said bolster for resisting further movement of said bolster saddle longitudinally of said bolster.

6. In a rail car truck, the combination of a bolster, a king pin seat formed in said bolster centrally of the ends thereof, a bolster saddle resiliently mounted on said bolster, a projection formed on the underside of said bolster saddle adapted to cooperate with said king pin seat in said bolster for limiting movement of said bolster saddle relative to said bolster, a king pin seat formed in the upper surface of said bolster saddle for receiving the king pin of a car body, and means between said bolster and said bolster saddle for translating movement of the latter longitudinally of said bolster into rotational movement.

7. In a rail car truck, the combination of a bolster,

a king pin seat formed in said bolster centrally of the ends thereof, a bolster saddle resiliently mounted on said bolster, a projection formed on the underside of said bolster saddle adapted to cooperate with said king pin seat in said bolster for limiting movement of said bolster saddle relative to said bolster, a king pin seat formed in the upper surface of said bolster saddle for receiving the king pin of a car body, frictional means carried by said bolster saddle and adapted to engage the sides of said bolster, and means between said bolster and said bolster saddle for translating relative movement of the latter longitudinally of said bolster into rotational movement whereby at least one of said frictional means is forced into frictional engagement with said bolster for resisting further movement of said bolster saddle longitudinally of said bolster.

8. In a rail car truck, the combination of a bolster, a king pin seat formed in said bolster centrally of the ends thereof, a bolster saddle resiliently mounted on said bolster, a projection formed on the underside of said bolster saddle adapted to cooperate with said king pin seat in said bolster for limiting movement of said bolster saddle relative to said bolster, a king pin seat formed in the upper surface of said bolster saddle for receiving the king pin of a car body, a vertical laterally extending flange plate carried by said bolster intermediate the ends thereof, resilient means adjacent opposite sides of said flange plate and carried by said bolster saddle whereby upon relative movement of said bolster saddle longitudinally of said bolster one of said resilient means engages said flange plate causing said bolster saddle to rotate thereby translating longitudinal movement of said bolster saddle into rotational movement.

9. In a rail car truck, the combination of a bolster, a king pin seat formed in said bolster centrally of the ends thereof, a substantially inverted U-shaped bolster saddle overlying said bolster, resilient sandwich members at the ends of said bolster saddle secured at their lower surfaces to said bolster and at their upper surfaces to said bolster saddle, a projection formed on the underside of said bolster saddle adapted to cooperate with said king pin seat in said bolster for limiting movement of said bolster saddle relative to said bolster, a king pin seat formed in the upper surface of said bolster saddle for receiving the king pin of a car body, frictional block members carried by the vertical legs of said bolster saddle adjacent the ends thereof and facing the sides of said bolster, a vertical laterally extending flange plate carried by said bolster intermediate the ends thereof, resilient means adjacent opposite sides of said flange plate and carried by said bolster saddle whereby upon relative movement of said bolster saddle longitudinally of said bolster one of said resilient means engages said flange plate causing said bolster saddle to rotate thereby forcing said frictional block members at one pair of diagonal corners of said bolster saddle into frictional engagement with said bolster for resisting further movement of said bolster saddle longitudinally of said bolster.

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