Aug. 22, 1933. G. G. GILPIN 1,923,435

UPPER BUFFER MECHANISM FOR RAILWAY CARS

Filed Dec. 10, 1931

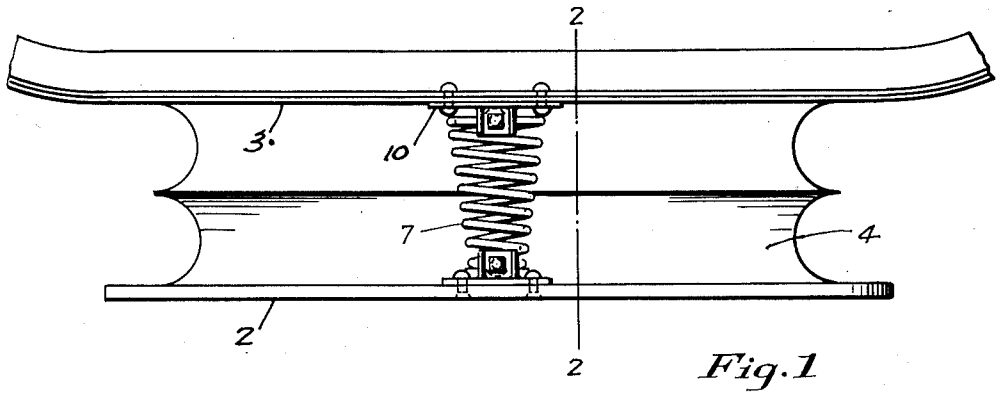


Fig. 1

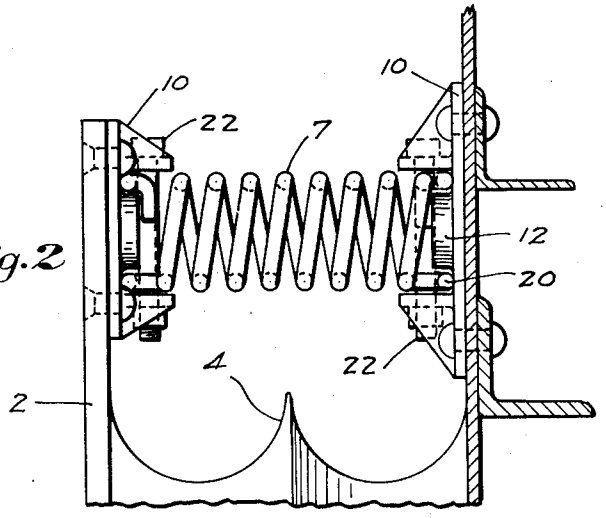
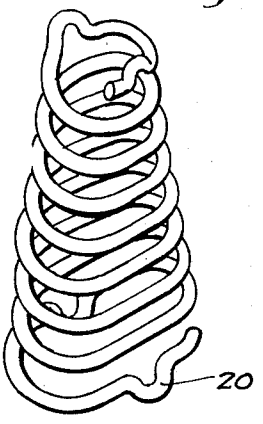


Fig. 2

Fig. 3



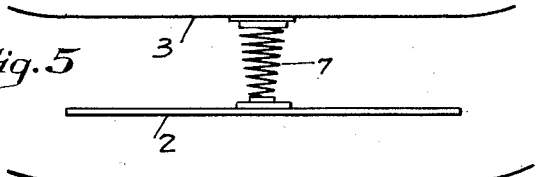


Fig. 5

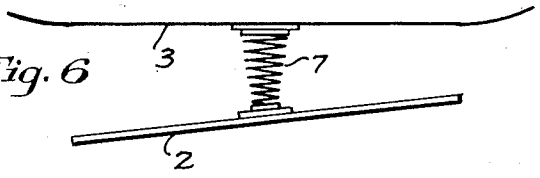


Fig. 6

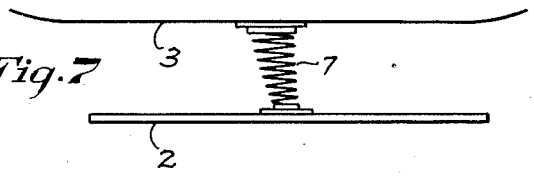


Fig. 7

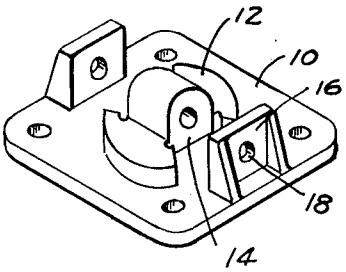


Fig. 4

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UPPER BUFFER MECHANISM FOR RAILWAY CARS

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14 Claims. (Cl. 105—15)

The invention relates to railway passenger train cars and more particularly to upper buffer mechanisms therefor, which mechanisms are used to keep the diaphragm face plates of adjacent passenger train cars in contact on either a straight or curved track.

An object of the invention is to provide such an upper buffer mechanism which not only keeps the adjacent face plates in contact, but which tends to return each face plate to the longitudinal center of the car and which also tends to maintain each face plate substantially parallel to the end wall of the car. Such device or devices may be attached to the diaphragm face plate above the diaphragm or may be attached to the diaphragm face plate on opposite sides of the diaphragm.

In my device I accomplish the above results by providing a coil spring having one end secured to the end wall of the car and the other end secured to the diaphragm face plate. The coil spring is slightly compressed in coupling the cars which compression maintains the diaphragm face plates of the coupled cars in contact with each other. The means of securing the spring to these respective elements holds the spring in contact with the element and, furthermore, prevents the spring from slipping or moving bodily laterally and also preferably rigidly secures both sides of the outer coil of the coil spring to the element so that any tendency of one end of the spring to move laterally is resisted by the securing means at the other end of the spring and thereby distorts the spring so that the spring tends to return to its normal position; in other words, if the diaphragm face plate moves sidewise of the car the spring tends to return it to its normal central position or if the diaphragm face plate moves upwardly or downwardly the spring tends to return it to its normal position. If when as in rounding curves in the track the face plate assumes an oblique position to the car end the spring tends to return the face plate parallel to the car end. The spring acts as a cushioning device whether the face plate is in normal, oblique and/or in a position to one side of normal position.

For the purpose of describing and defining this invention the term "distorted", as herein used, means that the spring is deformed laterally of its longitudinal axis in differentiation from the term "compression", which, as herein used, means that the spring is deformed coincident with its longitudinal axis. These are general engineering terms.

Another object of my particular form or method of securing the spring to the face plate or end wall of the car is to hold the face plate in a predetermined position when the face plate is not in contact with another face plate. This condition prevails when the face plate in question is on the end of the train.

Another object of the invention is to provide means to attach a coil spring to a car part so as to provide a good bearing for the spring; to retain the end coil of the coil spring in engagement with said bearing so as to resist lateral torsion of the other end of the spring; to hold the spring in engagement with the car part against movement longitudinally of the axis of the spring away from the car part and to resist any tendency of the spring to rotate around its longitudinal axis.

Another object of the invention is to provide a coil spring having a relatively large diameter or width in one direction and a relatively small diameter, or width in the direction substantially normal thereto so that the spring may be applied to the car under limited restrictions, which spring is preferably larger in diameter or width at one end than at the other end thereof to provide better stabilization, therefore, a further object of the invention is to provide an upper buffer mechanism comprising a coil spring of different diameters or widths to accommodate certain car restrictions and to obtain certain desirable results.

In the drawing:

Fig. 1 shows a typical application of my invention to a railway car.

Fig. 2 is an enlarged section on line 2—2 of Fig. 1.

Fig. 3 shows a typical spring used in my invention.

Fig. 4 is a typical spring bearing plate.

Figs. 5, 6 and 7 are diagrams showing the device in several positions which are described later.

The diaphragm face plate 2 is spaced away from the end wall 3 of the car and connected thereto by the diaphragm 4 to form a passageway between adjacent cars, and my improved device is positioned between the end wall and the diaphragm face plate preferably above the diaphragm 4 or may be positioned on opposite sides of the diaphragm.

The coil spring 7 is secured to the end wall 3 and diaphragm face plate 2, respectively, by means which retain one or both ends of the spring in predetermined position relative thereto;

that is, for instance, the spring 7 is attached to the end wall 3 of the car by means which provides a bearing for the spring under compression, which means also prevents movement of the spring as an entirety away from the end wall of the car. The means also prevents bodily movement of the spring laterally of its longitudinal axis; furthermore, such means holds the spring in engagement with its bearing when the other end of the spring is distorted or moved out of its longitudinal axis. The means also prevents the spring from rotating around its longitudinal axis, which is desirable when the spring is of non-cylindrical form.

By such an arrangement when the diaphragm face plate 2 assumes an angular position, as shown in Fig. 6, the spring 7 tends to return the face plate 2 to the normal position parallel to the end wall of the car and also when the diaphragm face plate moves laterally of the car, as shown in Fig. 7, the spring tends to return the face plate to its normal central position, as shown in Fig. 5. The combination of the movements shown in Figs. 6 and 7 also occur in service.

The spring 7 is preferably made of a relatively large width or diameter adjacent the end wall 3 of the car which tapers to a relatively small width or diameter adjacent the face plate 2, as shown in Fig. 1, which stabilizes the spring because when the face plate has moved sidewise, as shown in Fig. 7, the center of the small diameter is over the area of the base of the large diameter and eliminates any tipping tendency of the spring under compression.

As there is a limited vertical space between the top of the diaphragm 4 and the top of the diaphragm face plate 2, I prefer to provide a spring having a relatively large horizontal diameter and a relatively small vertical diameter so as to get a stronger and more resilient spring in the limited space.

In the preferred form the spring has a relatively large horizontal diameter or width and a relatively small vertical diameter or width and tapers from a relatively large width adjacent the end wall of the car to a relatively small width adjacent the diaphragm face plate.

In the preferred form the means of securing the spring 7 to either the end wall 3 of the car or the diaphragm face plate 2, or preferably both of them, comprises a member 10 having a spring bearing 12 with interrupted portions 14 and lugs 16 having perforations 18 aligned with said interrupted portions. The coil spring 7 rests upon the bearing 12 and is provided with offset parts 20 penetrating said interrupted portions and a bolt 22 is inserted through the perforations 18 in the lugs which engages the offset parts of the spring to secure the spring to the member in such a way as to prevent lateral movement of the spring normal to the bolt; prevent the spring from rotating about its longitudinal axis and retain the spring in engagement with the bearing of the member so that the spring yieldingly resists any tendency of the other end of the spring to move laterally. The spring engages the lugs to prevent lateral movement of the spring lengthwise of the bolt. It is desirable to prevent the spring from rotating about its longitudinal axis especially when a non-cylindrical spring is used. If desired the bolt 22 may be tapered to form a wedge to obtain a tight connection between the spring 7 and the member 10. The term "spring seat", as used herein, does not necessarily mean a separate member, but may be an integral part of the face plate or end wall.

The coil spring is preferably made of a round bar but may be of square or rectangular material or may be made of convolute configuration.

The accompanying drawing illustrates the preferred form of the invention, though it is to be understood that the invention is not limited to the exact details of construction shown and described, as it is obvious that various modifications thereof, within the scope of the claims, will occur to persons skilled in the art.

I claim:

1. In a railway car having an end wall with a spring seat, a diaphragm face plate with a spring seat, the combination of a coil spring positioned between said spring seats, and means to retain the ends of the spring in a predetermined relation to the end wall and face plate, respectively, whereby a movement of said face plate toward said end wall compresses the spring and a lateral movement of said face plate distorts the spring.

2. In a railway car having an end wall with a spring seat, a diaphragm face plate with a spring seat, the combination of a coil spring positioned between said spring seats, and means to retain the ends of the spring in a predetermined relation to the end wall and face plate, respectively, whereby a movement of said face plate toward said end wall compresses the spring, a movement of said face plate away from said end wall expands the spring and a lateral movement of said face plate distorts the spring.

3. In a railway car having an end wall element with a spring seat, a diaphragm face plate element with a spring seat, the combination of a coil spring positioned between said spring seats tapering from a relatively large width adjacent one of said elements to a relatively small width adjacent the other of said elements, and means to retain the ends of the spring in a predetermined relation to the end wall and face plate, respectively, whereby a movement of said face plate toward said end wall compresses the spring and a lateral movement of said face plate distorts the spring.

4. In a railway car having an end wall with a spring seat, a diaphragm face plate with a spring seat, the combination of a coil spring positioned between said spring seats tapering from a relatively large width adjacent said end wall to a relatively small width adjacent said face plate, and means to retain the ends of the spring in a predetermined relation to the end wall and face plate, respectively, whereby a movement of said face plate toward said end wall compresses the spring and a lateral movement of said face plate distorts the spring.

5. In a railway car having an end wall with a spring seat, a diaphragm face plate with a spring seat, the combination of a coil spring positioned between said spring seats having a varying horizontal width and a constant vertical width, and means to retain the ends of the spring in a predetermined relation to the end wall and face plate, respectively, whereby a movement of said face plate toward said end wall compresses the spring and a lateral movement of said face plate distorts the spring.

6. In a railway car having an end wall with a spring seat, a diaphragm face plate with a spring seat, the combination of a coil spring positioned between said spring seats having a relatively large horizontal diameter and a relatively small verti-

cal diameter, and means to retain the ends of the spring in a predetermined relation to the end wall and face plate, respectively, whereby a movement of said face plate toward said end wall compresses the spring and a lateral movement of said face plate distorts the spring.

7. In a railway car having an end wall element and a diaphragm face plate element, the combination of a member secured to one of said elements having a spring bearing with interrupted portions and lugs having perforations therein, a coil spring engaging said bearing, said spring having offset parts penetrating the interrupted portions of the bearing, and a bolt passing through said perforations and engaging said offset parts of the spring so as to secure the spring to the member and prevent lateral movement of the spring normal to the bolt.

8. In a railway car having an end wall element and a diaphragm face plate element, the combination of a member secured to one of said elements having a spring bearing with interrupted portions and lugs having perforations therein, a coil spring engaging said bearing, said spring having offset parts penetrating the interrupted portions of the bearing, and a bolt passing through said perforations and engaging said offset parts of the spring so as to secure the spring to the member and prevent lateral movement of the spring normal to the bolt, said spring engaging said lugs to prevent lateral movement of the spring lengthwise of the bolt.

9. In a railway car having an end wall element and a diaphragm face plate element, the combination of a member secured to one of said elements having a spring bearing with interrupted portions and lugs having perforations therein, a coil spring engaging said bearing, said spring having offset parts penetrating the interrupted portions of the bearing, and a bolt passing through said perforations and engaging said offset parts of the spring so as to secure the spring to the member and retain the spring in engagement with the bearing so that the spring yieldingly resists any tendency of the other end of the spring to move laterally.

10. In a railway car having an end wall element and a diaphragm face plate element, the combination of a member secured to one of said elements having a spring bearing with interrupted portions and lugs having perforations therein, a coil spring of non-cylindrical formation engaging said bearing, said spring having offset parts penetrating the interrupted portions of the bearing, and a bolt passing through said perforations and engaging said offset parts of the spring so as to secure the spring to the member and prevent the spring from rotating about its longitudinal axis.

11. A coil spring for use in an upper buffer mechanism of a railway car having a constant width in one direction, and having a varying width in a direction substantially normal thereto which constantly decreases between opposite ends of the spring, the coil at one end of the spring being of circular formation.

12. A coil spring for use in an upper buffer mechanism of a railway car having a constant and relatively small width in one direction, and having a varying and relatively large width in a direction substantially normal thereto which constantly decreases between opposite ends of the spring, the coil at one end of the spring being of circular formation.

13. A coil spring for use in a railway car structure with the coil at one end thereof of circular formation and with the coil at the other end thereof having a substantially elliptical formation.

14. In a railway car having an end wall with a spring seat, a diaphragm face plate with a spring seat, the combination of a coil spring positioned between said spring seats, and means to retain the ends of the spring in a predetermined relation to the end wall and face plate, respectively, whereby a movement of said face plate toward said end wall compresses the spring and a movement of the face plate normal to the longitudinal axis of the spring distorts the spring.

GARTH G. GILPIN.