June 11, 1946. G. G. GILPIN 2,401,823

SUPPORTING AND POSITIONING DEVICE FOR CAR COUPLERS

Filed Nov. 12, 1943 2 Sheets-Sheet 1

Fig. 1.

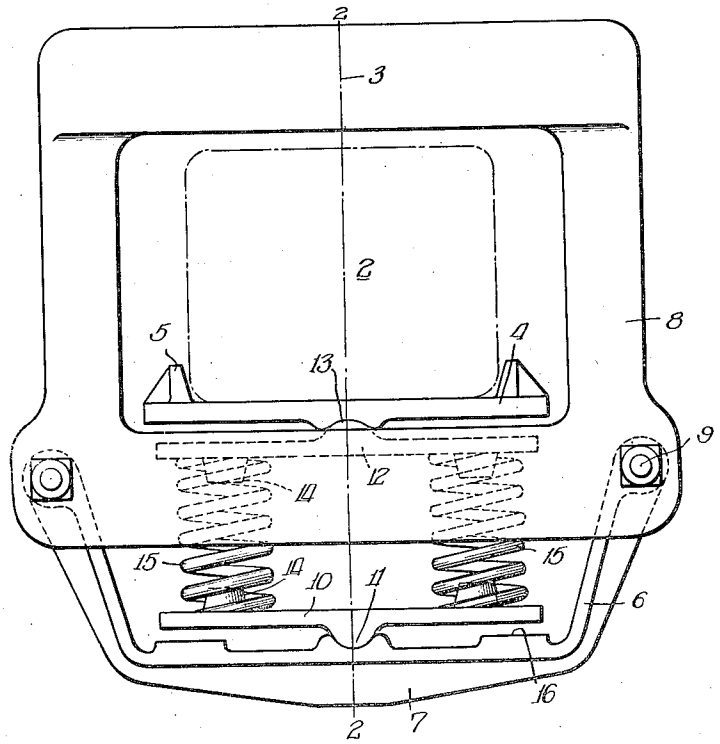
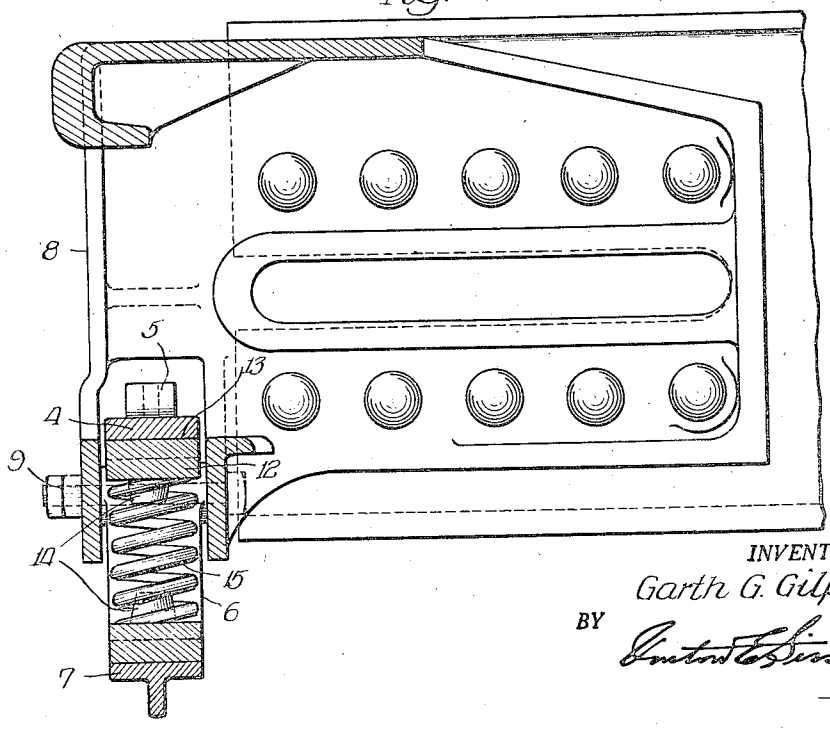


Fig. 2.



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Fig. 5

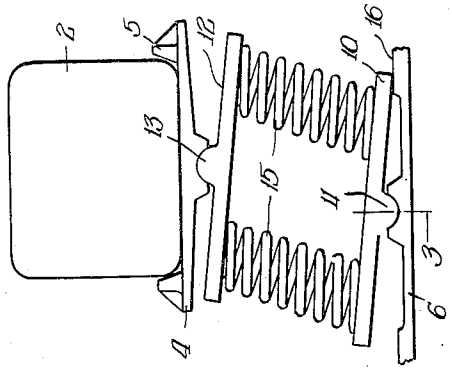


Fig. 8

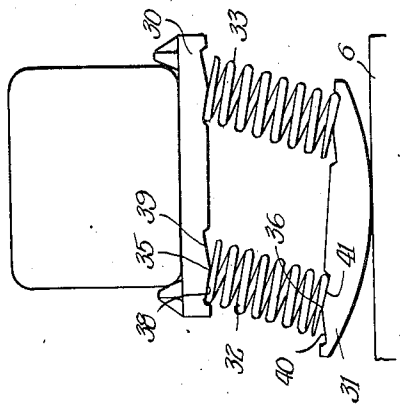


Fig. 4

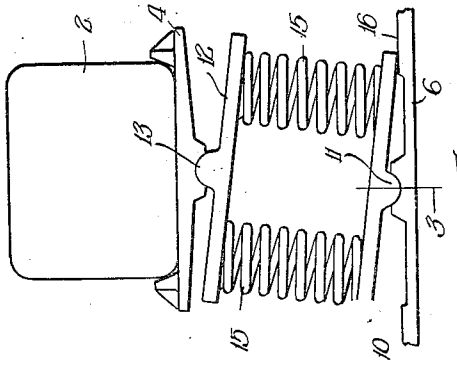


Fig. 7

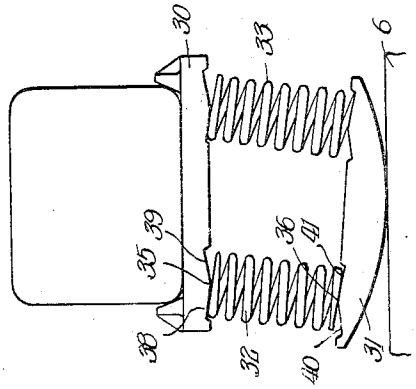


Fig. 3

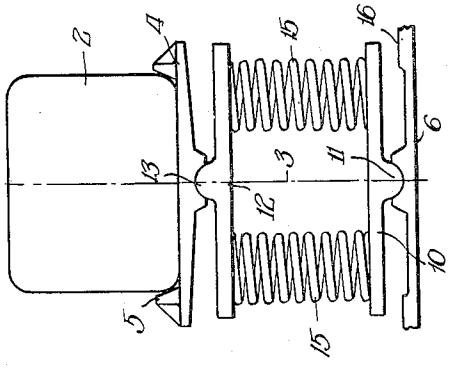
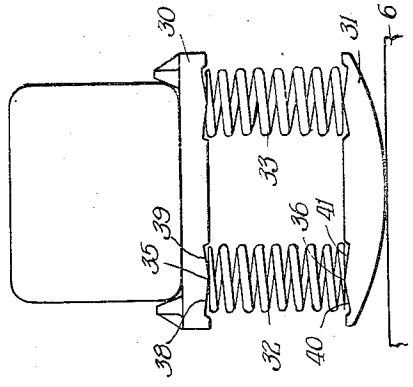


Fig. 6



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Patented June 11, 1946 2,401,823

UNITED STATES PATENT OFFICE

2,401,823

SUPPORTING AND POSITIONING DEVICE FOR CAR COUPLERS

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Application November 12, 1943, Serial No. 510,055

14 Claims. (Cl. 213—61)

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This invention relates to improvements in railway cars and more particularly to improvements in means for supporting the outer end of a railway car coupler adjacent its "head."

My present invention is an improvement over Patent No. 1,923,433 granted to me on August 22, 1933, and Patent No. 2,308,032 granted to James S. Swann on January 12, 1932, both of which patents are assigned to the same assignee to which this invention and application will be assigned.

One of the objects of the invention is to support a railway car coupler upon a device which permits the coupler to move horizontally and vertically with the coupler of another car when coupled thereto as the couplers adjust themselves to the curves and unevenness of the track, as well as causes the coupler to return to normal coupling range when free to do so; for instance, when a coupler supported by my device is uncoupled while the railway car is upon a curved track.

Another object of the invention is to provide a resilient means in a carrier for supporting the outer end of a coupler at a desired elevation during service movements of the car, but which means permits downward and/or lateral movement of the coupler when an additional live load is applied such as when two coupled cars are pulled over a track elevation, hump, vertical curve in the track, or around a curve, and wherein said carrier, when free to do so, will return the coupler to its normal height and simultaneously to a position at least adjacent the center of the car within coupling range.

Another object of the invention is to reduce the service stresses in the coupler by providing a resilient coupler carrier thereby permitting the outer end of the coupler to move vertically so that the center line of coupled couplers will be nearer a straight line, thus reducing the resultant force in the coupler shank. When the force ceases, as when the cars are uncoupled, the resilient carrier returns the coupler to its normal vertical position, which is an essential in accepted railroad operation when coupling railway cars.

A further object of my improved resilient coupler support and coupler centering device is to prevent jar in the coupler, caused by uneven track and the movement of the coupler on the carrier, from being transmitted by the coupler to adjacent car parts, and furthermore, to reduce the friction and wear between the associated parts.

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Another object is to provide a resilient means which cushions and centers the coupler by maintaining the carrier in adjustment with the coupler, and which may be readily and quickly assembled or taken apart; is very light in weight and economical to manufacture.

Another object of the invention is to resiliently support the coupler by a pair of spaced apart springs and provide means whereby upon lateral movement of the coupler (in either direction) a predetermined distance the springs will not be distorted, but upon lateral movement of the coupler beyond said predetermined distance the springs will be distorted, thereby causing a tendency to return the coupler to its normal coupling range. The object of such arrangement is to relieve the springs of any distortion during normal service movements of the car, but to provide means to return the coupler to its normal central position upon an abnormal lateral movement of the coupler, or upon movement of the coupler beyond its coupling range. The distance two couplers are out of alignment and will still couple is called the coupling range.

Throughout the specification, wherever the term "coupler" is used, it is understood to mean a standard railway car coupler wherein no provision is made for the coupler to rotate around its longitudinal axis.

Also in the modifications of the invention some of the elements roll, some rock and some do both simultaneously, therefore, applicant has used in the specification and claims the word "rock" (and derivations thereof) with the understanding that, for the purpose of describing the invention, the term includes rocking and/or rolling action.

In the drawings:

Fig. 1 shows the striking casting of a railway car with my device applied thereto.

Fig. 2 is a section on line 2—2 of Fig. 1.

Fig. 3 shows the coupler and my device in normal position; that is, adjacent the middle of the car.

Fig. 4 shows the coupler and the relative position of the component elements of my device when the coupler has been moved laterally a predetermined distance.

Fig. 5 is the same as Fig. 4 except that the coupler has been moved laterally more than said predetermined distance.

Fig. 6 shows a modification of the invention with the coupler in normal position.

Fig. 7 shows the modification with the coupler moved laterally a predetermined distance.

Fig. 8 shows the modification with the coupler moved laterally more than said predetermined distance.

The construction shown in Figs. 1 and 2 is diagrammatically illustrated in Figs. 3, 4 and 5 wherein the coupler 2 is normally positioned at the middle 3 of the car and is arranged to move laterally and/or vertically of the car in service. The coupler rests upon a coupler carrier 4 which moves vertically with the coupler and the carrier 4 is provided with lugs 5 on opposite sides of the coupler so that the carrier moves laterally in horizontal planes, in either direction, with the coupler. A member 6 having a portion 7 below the coupler is fixed to the striking casting 8 by the bolts 9.

My improved device is positioned between the fixed member 6 and the coupler carrier 4 and supports the coupler 2 and carrier 4 upon the fixed member 6.

Fig. 3 shows the relative position of the coupler 2, carrier 4 and the several parts of my device when the coupler is in normal position; that is, adjacent the middle 3 of the car.

My device comprises a spring seat 10 pivotally mounted 11 upon the fixed member 6 to swing laterally of the car and a spring cap 12 pivotally mounted 13 upon the carrier 4 to swing laterally of the car and springs 15 interposed between the spring cap 12 and spring seat 10 and spaced equi-distant on opposite sides of the pivots 11—13. These pivots are preferably positioned adjacent the middle 3 of the car. In this position the springs resiliently support the coupler 2 and the carrier 4 and cushion the coupler against the service movements due to rough and uneven track.

Fig. 4 shows the position of the coupler 2, carrier 4 and associated parts of my device when the coupler has moved laterally toward one side of the car, in which position it may not be necessary to return the coupler to the middle of the car, because the coupler in this position is within coupling range; that is, close enough to couple with the coupler of an oncoming car. In practice this will be about ⅞" lateral movement of the coupler. To assume this position the spring cap 12, springs 15 and spring seat 10 have swung as a unit about both pivots 11—13 without distorting the springs and without affecting their efficiency as to cushioning means for the coupler.

Fig. 5 shows the coupler 2, carrier 4 and associated parts of the device when the coupler has moved beyond the above mentioned predetermined movement of about ⅞" to about 1¾" which is the permissible movement in freight cars. When the coupler has been moved laterally to the position shown in Fig. 4 the spring seat 10 has engaged a stop 16 on the member 6 fixed to the car so that further movement of the spring seat is arrested. However, further lateral movement of the coupler will carry the carrier and spring cap with it and cause the springs to be distorted, as shown in Fig. 5, which distortion provides a stored force which causes the springs to urge the carrier and the coupler toward central position; that is, at least to a position within coupling range. The coupler and carrier will thus be returned to coupling range when the coupler is free to so return which will be when the coupler is detached from the other coupler. Any desired means, such as the lugs 14, on the spring seat and spring cap may be used to hold the springs in place.

The word "distorted," as used herein, means

that the axis of the coil spring is moved away from a right angle to the plane (or planes) of the base (or bases) of the spring. The term is used to differentiate from straight compression of the spring.

The member 6 may be fixed to the car in any desirable manner, and likewise, any desired construction may be used to restrict the downward movement of the coupler carrier, so as not to compress the springs too much and any construction may be used to restrict the movement of the coupler carrier lengthwise of the car though permitting said carrier to freely move laterally of the car. It is common practice to allow a carrier to swing laterally of the car between two walls which are fixed to the car, and arrange such walls to limit the downward movement of the carrier.

Figs. 6, 7 and 8 show a modified construction wherein the carrier 30 performs the functions of the spring cap so that a separate spring cap is not necessary and the spring seat is in the form of a rocker 31 which rocks upon the fixed member 6 when the coupler moves laterally. In the modification the carrier 30 is held in a horizontal position by the coupler as the coupler is moved laterally. When the coupler moves laterally a predetermined distance to the right (as shown in Fig. 7) the rocker 31 rocks upon the fixed member 6 and the left spring 32 is compressed while the right spring 33 is neither compressed nor relieved to any appreciable extent, thus the left spring 32 urges the device to return to normal position.

The springs 32—33 are pivotally mounted (35—36) upon the carrier 30 and spring seat 31, respectively, between oppositely inclined surfaces 38—39—40 and 41. The inclined surfaces are so shaped and positioned that until the coupler has moved a predetermined amount (as shown in Fig. 7) neither of the springs 32—33 is distorted, but upon further lateral movement of the coupler, the springs pivotally swing upon the pivots 35 and 36 and engage the inclined surfaces in the carrier and spring seat, respectively, at the opposite diagonal corners thereof, which distorts both of the springs, as shown in Fig. 8, thus providing an additional force to urge the device and coupler toward normal position. As the device moves from the position shown in Fig. 7 to that shown in Fig. 8, neither of the springs is further appreciably distorted. Any desirable means may be used to prevent the rocker 31 from slipping upon the fixed member 6.

The accompanying drawings illustrate 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.

In my application Serial No. 510,056, filed November 12, 1943 concurrently herewith, I have disclosed but not claimed certain features claimed herein.

I claim:

1. A cushioning coupler supporting and positioning device for a railway car coupler movable laterally and vertically of a car in substantially horizontal planes, said car having a member fixed to the car below the coupler which member is provided with spaced stops; said device comprising a spring seat rockably mountable upon said fixed member and adapted to rock in a plane transversely of the longitudinal axis of the car,

a spring cap, a coupler carrier rockably mountable upon said spring cap to rock in a plane transversely of the longitudinal axis of the car, said coupler carrier movable laterally and vertically with the coupler, and spaced springs adapted to be interposed between said spring seat and spring cap, whereby when the device is applied to a car and the carrier is moved in horizontal planes laterally by the coupler the spring cap, springs and spring seat rock as a unit without distorting the springs until the spring seat engages a stop on the fixed member and whereby during further lateral movement of the carrier in horizontal planes the spring seat is arrested and the spring cap moves with the carrier thereby distorting the springs and providing a restoring force urging the device toward normal coupling range.

2. A coupler cushioning, positioning and supporting device for a railway car coupler movable laterally and vertically of a car in substantially horizontal planes, said car provided with a coupler carrier to move therewith, which carrier is positioned above a member fixed to the car; said device comprising tiltable spaced springs adapted to resiliently support the carrier upon said member, and means including a rocker adapted to be interposed between said springs and said member and carrier, respectively, when the device is applied to a car to rockably and tiltably support said springs and to allow a predetermined lateral movement of the carrier without distortion of the springs but which upon further lateral movement of the carrier distorts the springs, thus providing a restoring force in the springs to urge the carrier to normal coupling range.

3. A coupler cushioning, positioning and supporting device for a railway car coupler movable laterally and vertically of a car in substantially horizontal planes, said car provided with a coupler carrier to move therewith, which carrier is positioned above a member fixed to the car; said device comprising tiltable spaced springs adapted to resiliently support the carrier, and means including a rocker adapted to rockably and tiltably support said springs upon said member, said springs adapted to be operatively associated with said carrier, means and member, respectively, when said device is applied to a car to allow a predetermined lateral movement of the carrier in horizontal planes without distortion of the springs and upon further lateral movement of the carrier in horizontal planes cause distortion of the springs, thus providing a restoring force in the springs to urge the carrier to normal coupling range.

4. A cushioning and positioning device to support a coupler carrier upon a member fixed to a car, which carrier is movable vertically and laterally of the car in horizontal planes; said device comprising a spring seat, a spring cap, spaced springs adapted to be interposed therebetween, and means including a rocker adapted to limitedly tiltably and rockably support said device between said carrier and member, a respectively, when said device is applied to a car to allow a limited tilting and rocking of said device as a unit during a predetermined lateral movement of the carrier without distorting said springs, and to cause said springs to be distorted upon further lateral movement of the carrier and thus provide a restoring force in the springs to urge the carrier toward coupling range.

5. A cushioning coupler supporting and positioning device for a railway car coupler movable vertically and laterally of a car in substantially horizontal planes, said car having a member fixed to the car below the coupler; said device comprising a carrier adapted to support a coupler and to move in horizontal planes vertically and laterally with the coupler, a spring seat adapted to rock upon the member in a plane transversely of the longitudinal axis of the car, and spaced springs adapted to be interposed between said carrier and said spring seat substantially equidistant on opposite sides of the middle of the car, said springs being rockably mounted upon the carrier and spring seat, respectively, between oppositely inclined surfaces, when the device is applied to a car, said inclined surfaces being positioned so that as the carrier is moved laterally in horizontal planes a predetermined distance neither spring is distorted but the trailing spring is compressed more than the leading spring, thus providing a restoring force to return the carrier toward normal coupling range.

6. A device as defined in claim 5 wherein said inclined surfaces are positioned so that upon further lateral movement of the carrier the springs are distorted, and whereby the distortion and unequal compression of the springs combine in providing a restoring force to urge the carrier toward normal coupling range.

7. A coupler cushioning and positioning device for a railway car coupler arranged to move in horizontal planes laterally and vertically of the car, within a support having a member below the coupler; said device comprising tiltable spaced springs adapted to resiliently support the coupler, and means including a rocker adapted to tiltably and rockably support said springs upon said member, said springs adapted to be operatively associated with said coupler, means and member, respectively, when said device is applied to a car to allow a predetermined lateral movement of the coupler without distortion of the springs and upon further lateral movement of the coupler cause distortion of the springs, thus providing a restoring force in the springs to urge the coupler to normal coupling range.

8. A cushioning coupler supporting and positioning device for a railway car coupler movable laterally and vertically of a car in substantially horizontal planes, which car is provided with a part having a portion below the coupler; said device comprising tiltable spaced springs adapted to resiliently support the coupler, and means including a rocker adapted to tiltably and rockably support said springs upon said portion, said springs adapted to be operatively associated with said coupler, means and portion, respectively, when said device is applied to a car to allow a predetermined lateral movement of the coupler without distortion of the springs and upon further lateral movement of the coupler cause distortion of the springs, thus providing a restoring force in the springs to urge the coupler to normal coupling range.

9. A cushioning coupler supporting and positioning device for a railway car coupler movable laterally and vertically of a car in substantially horizontal planes, which car is provided with a part having a portion below the coupler; said device comprising spaced apart springs adapted to resiliently support the coupler, and means including a rocker adapted to rockably support said springs upon said portion, said springs adapted to be operatively associated with said coupler, means and portion, respectively, when said device is applied to a car to allow a predetermined lateral

movement of the coupler without distortion of the springs and upon further lateral movement of the coupler cause distortion of the springs, thus providing a restoring force in the springs to urge the coupler to normal coupling range.

10. A cushioning coupler supporting and positioning device for a railway car coupler movable laterally and vertically of a car in substantially horizontal planes, which car is provided with a part having a portion below the coupler; said device comprising a coupler carrier adapted to support said coupler and move laterally and vertically therewith, tiltable spaced springs adapted to resiliently support said carrier, and means including a rocker adapted to tiltably and rockably support said springs upon said portion, said springs operatively associated with said coupler, means and portion, respectively, when said device is applied to a car to allow a predetermined lateral movement of the coupler without distortion of the springs and upon further lateral movement of the coupler cause distortion of the springs, thus providing a restoring force in the springs to urge the coupler to normal coupling range.

11. A cushioning coupler supporting and positioning device for a railway car coupler movable laterally and vertically of a car in substantially horizontal planes, which car is provided with a part having a portion below the coupler; said device comprising a coupler carrier adapted to support said coupler and move laterally and vertically therewith, spaced springs adapted to resiliently support said carrier, and means including a rocker adapted to support said springs upon said portion, when the device is applied to a car said carrier and said means being so formed as to have a limited tiltable engagement with said springs to allow a predetermined lateral movement of the coupler without distortion of the springs and upon further lateral movement of the coupler cause distortion of the springs, thus providing a restoring force in the springs to urge the coupler to normal coupling range.

12. A cushioning coupler supporting and positioning device for a railway car coupler movable laterally and vertically of a car in substantially horizontal planes, which car is provided with a part having a portion below the coupler; said device comprising a coupler carrier adapted to support said coupler and move laterally and vertically therewith, tiltable spaced springs adapted to resiliently support said carrier, and means including a rocker to support said springs, said means tiltably and rockably supported upon said portion, said carrier and said means having a limited tiltable engagement with said springs to allow a predetermined lateral movement of the coupler without distortion of the springs and upon further lateral movement of the coupler cause distortion of the springs, thus providing a restoring force in the springs to urge the coupler to normal coupling range.

13. A cushioning coupler supporting and positioning device for a railway car coupler movable laterally and vertically of a car in substantially horizontal planes, which car is provided with a part having a portion below the coupler; said device comprising a spring cap, spaced springs adapted to resiliently support said spring cap and a spring seat adapted to tiltably support said springs upon said portion, when the device is applied to a car said spring seat being so formed so as to have a limited tiltable engagement with said portion to allow a predetermined lateral movement of the coupler without distortion of the springs and upon further lateral movement of the coupler cause distortion of the springs, thus providing a restoring force in the springs to urge the coupler to normal coupling range.

14. A cushioning coupler supporting and positioning device for a railway car coupler movable laterally and vertically of a car in substantially horizontal planes, which car is provided with a part having a portion below the coupler; said device comprising a coupler carrier adapted to support said coupler and move laterally and vertically therewith, tiltable spaced springs adapted to resiliently support said carrier, and a member adapted to support said springs, which member is rockably supported upon said portion when the device is applied to a car, said carrier and said member being formed so as to have a limited tiltable engagement with said springs to allow a predetermined lateral movement of the coupler without distortion of the springs and upon further lateral movement of the coupler cause distortion of the springs, thus providing a restoring force in the springs to urge the coupler to normal coupling range.

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