Nov. 19, 1935. W. J. TANGERMAN 2,021,570

RAILWAY CAR COUPLER SUPPORT

Filed Sept. 18, 1933

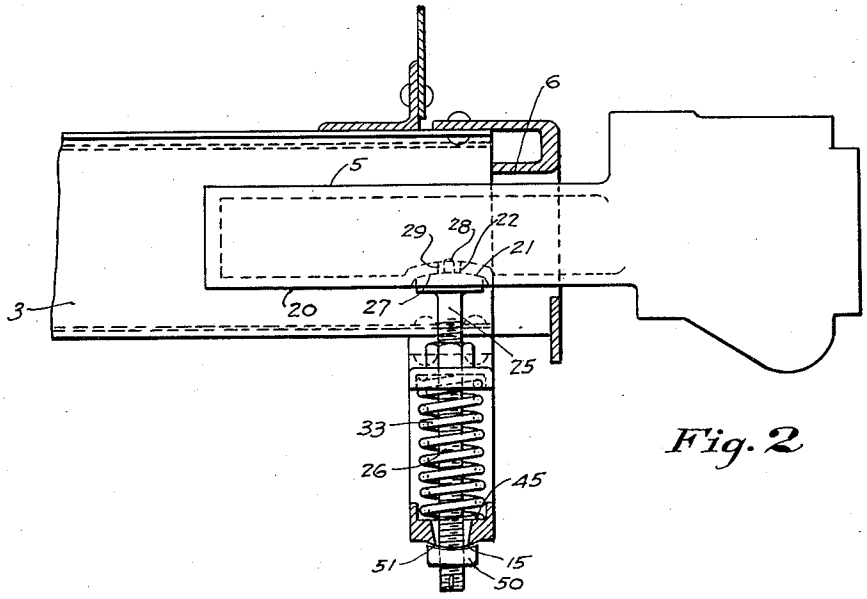


Fig. 2

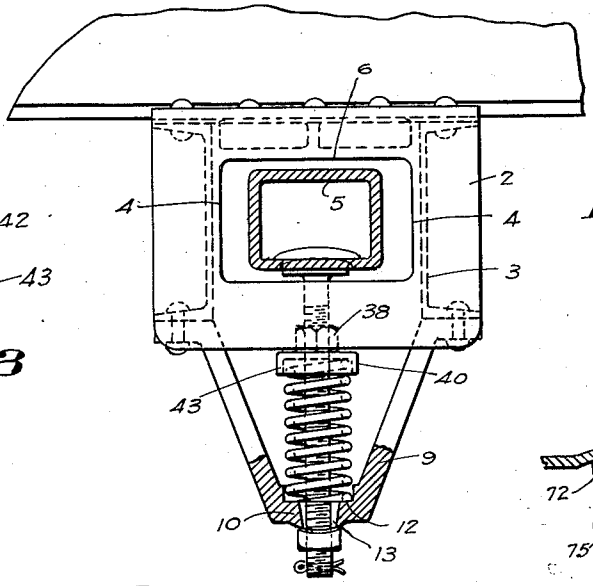


Fig. 1

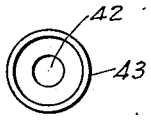


Fig. 3

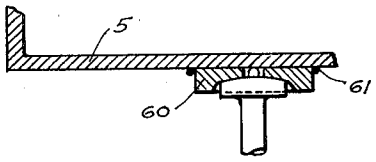


Fig. 4

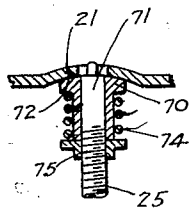


Fig. 5



Fig. 6.

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RAILWAY CAR COUPLER SUPPORT

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17 Claims. (Cl. 213—21)

The device relates to railway cars and more particularly to the means for supporting the outer end of a railway car coupler adjacent its "head" which permits the coupler to move horizontally and vertically and adjust itself to the curves and unevenness of the track, and one of the objects of the invention is to provide a yielding means for supporting the outer end of the coupler in a vertical and/or horizontal direction so that when free to do so the coupler will return to its normal height and to a position adjacent the center of the car, which arrangement has several objects and advantages hereinafter enumerated.

When a coupler is supported by a carrier, which is immovable vertically, a great stress is thrown in the shank of the coupler when the car passes over a hump or valley in the track (technically known as vertical curves) which when occurring while the couplers are under severe pulling or buffing stresses is a serious matter and this condition was a contributing cause of the American Railway Association increasing the size of the standard coupler shank. One of the objects of the invention, therefore, is to reduce the service stresses in the coupler by providing a yielding coupler carrier thereby permitting the outer end of the coupler to move downwardly so that the center line of the coupled couplers will be nearer a straight line, thereby reducing the resultant forces in the coupler shanks. When the force ceases, for instance, when the cars are uncoupled, the yielding carrier forces the coupler to its normal vertical position, which is prescribed by the American Railway Association and which is necessary so that the couplers will automatically couple when the cars are run together.

Another object of the yielding carrier is to prevent the jar in the coupler caused by the uneven track and the movement of the coupler upon the carrier from being transmitted to the adjacent car parts, which jar and vibration causes the fastening means, such as bolts, to become loose, or perhaps entirely ineffective. Jars and jolts between the coupler and the carrier are also caused by the engaging parts of the two coupled couplers slipping over each other under pressure. Furthermore, such yielding means, by reducing the vertical force of the coupler upon its carrier, reduces the friction and consequent wear between these parts. The wear upon the coupler shank makes a weak place in the shank causing it to break at that place when the cars are coupled, especially when coupled in a hump or valley in the track.

Another object of the invention is to provide a coil spring to support a car coupler and position it in the car relative to the car coupler so that when the coupler moves sidewise of the car the spring is distorted, causing a tendency for the spring to return the coupler to the center of the car and when the coupler moves vertically the spring is compressed causing a tendency to return the coupler to its normal height.

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 is to provide a device which cushions and centers the coupler without twisting the coupler when the cars go around curves, which twisting action distorts the coupler shank and moving parts of the coupler causing them to work hard or even bind, making the coupler inoperative. This is accomplished by maintaining the top of the carrier parallel to the bottom of the coupler and in contact therewith. In other words, the carrier adjusts itself to the coupler. Maintaining the width of the coupler shank in contact with the carrier maintains a large bearing area between these two elements and thereby reduces the wear upon them.

One of the objects of the invention is to increase the amount of permissible lateral movement of a coupler by providing automatic means for returning the couplers to the longitudinal center of the car or at least close enough thereto so that the automatic couplers will couple. This is what is termed the "coupling range".

It is very often necessary to couple cars on curves and frequently when the radius of the curve is very small, as is common around industrial plants, the couplers of the two cars will be so far out of alignment that they will not automatically couple. Another object of the invention is to automatically bring such couplers within coupling range.

In my device the lateral movement between the coupler and the carrier is eliminated, thus reducing friction and consequent wear on the parts. This is quite an item particularly in sandy countries because couplers are costly and the replacement of a coupler means keeping the car out of service.

Coupler positioning devices reduce the number of broken knuckles and guard arms on cou-

plers which members are frequently bent or broken when the couplers are not within coupling range. Such devices also reduce the number of accidents to trainmen as they are not required to go between the cars and position the coupler preparatory to coupling.

Another object of the invention is to provide means to limit the upward movement of the yielding coupler carrier so that the yielding means will not force the coupler up beyond the predetermined standard height established by the American Railway Association. It is also desirable to restrict the vertical upward movement of the coupler so that when the car is turned upside down in an unloading machine the component parts of the yielding means will not lose their proper relative positions and become ineffective.

Another object is to provide means independent of the cushioning means to keep the coupler carrier in engagement with the coupler in any vertical or horizontal position of the coupler.

Another object of the device is to provide a cushioning device for a railway car coupler which may be easily modified to center and position the coupler, which device comprises means to adjust the compression in the cushioning element and other means to adjust the vertical height of the coupler and wherein after the compression in the cushioning element has been adjusted the height of the coupler may be adjusted independently of the compression adjusting mechanism.

In the drawing:

Fig. 1 is an end elevation of a railway car equipped with my device (with the coupler shank shown in cross section).

Fig. 2 is a vertical section of Fig. 1.

Fig. 3 is a detail of the spreader washer.

Fig. 4 is a detail of a modified construction.

Fig. 5 shows an auxiliary device.

Fig. 6 shows the special nut.

In the form of my invention illustrated the striking casting 2 is secured to the draft sills 3 in any convenient manner and comprises spaced apart vertical walls 4 which limit the lateral movements of the coupler 5 and an upper horizontal wall 6 which limits the upward vertical movement of the coupler. The stirrup or other car part 9 is supported by some part of the car, such as the draft sills 3, which car part 9 is provided with a horizontal portion 10 with a substantially flat bearing surface 12 on the upper surface of the portion 10 which surrounds an aperture 13. The horizontal portion 10 is preferably also provided with a semi-spherical bearing surface 15 on the lower surface of the portion 10 of the car part 9 which also surrounds the aperture 13.

The lower surface 20 of the shank of the coupler 5 is provided with a semi-spherical bearing 21 which is preferably depressed in the surface 20 of the shank, which bearing surrounds a hole 22 in the lower wall of the shank.

The member 25 which supports the coupler 5 is provided with a threaded stem 26 with its lower end projecting through the aperture 13 in the car part 9 to provide a pivotal slidable engagement therewith. The upper end of the member 25 supports the coupler for movement thereof in a substantially horizontal plane. Preferably the upper end of the member 25 is provided with a semi-spherical bearing surface 27 engaging the bearing surface 21 of the coupler to form a universal joint. The member 25 is preferably provided with an extension 28 projecting through a hole 29 in the coupler shank.

A coil spring 33 surrounds the stem 26 of the supporting member 25 and rests upon the flat bearing surface 12 of the car part 9. (A rubber composite cushion, or any other metallic spring, or in fact, any yielding means, is the mechanical equivalent of the coil spring described and claimed herein).

An adjusting nut 38 on the stem of the supporting member 25 engages the upper part of the spring 33 and by moving this nut 38 up and down on the threaded stem 26 the vertical elevation of the coupler 5 is adjusted to compensate for the compression or yield of the spring. The spreader washer 40 is used if necessary. This nut 38 (and spreader washer 40) transmits the downward movement of the stem 26 of the supporting member 25 to the spring 33, providing a cushion for the coupler. When the coupler moves in a horizontal plane either longitudinally or laterally of the car, it moves the supporting member 25 with it, thus distorting the spring, which spring when returning to its normal condition (when free to do so) provides a coupler positioning device or centering device. If a large diameter spring 33 is used the hole 42 in the washer 40 fits the shank 26 of the supporting member 25 and the depending flanges 43 of the spreader washer engage the outer parts of the coil spring to cause the spring 33 to move with the supporting member 25. Also the bottom of the coil spring 33 preferably fits in a pocket 45 to prevent the spring from moving bodily laterally.

The adjusting nut 50 on the stem 26 of the supporting member 25 below the portion 10 of the car part is preferably cut out (51) to engage the semi-spherical bearing 15 on the lower surface of the portion 10 of the car part 9. This semi-spherical engagement between the car part 9 and the nut 50 allows the top of the supporting member 25 to move around without binding. The aperture 13 in the car part is preferably tapered to allow for this movement. By moving the nut 50 up and down on the stem 26 of the supporting member 25, any desired amount of compression in the spring 33 may be obtained. Thus the spring can be adjusted to obtain the proper cushioning effect and also the proper positioning effect of the spring on the coupler. It will be noted that after the proper compression is obtained in the spring the coupler height can be adjusted by moving both the upper nut 38 and the lower nut 50 on the stem 26 of the supporting member 25.

Fig. 4 shows a separate part 60 welded (61) or otherwise secured to the shank of the coupler 5, which construction may be desirable for couplers not especially made for this device.

Fig. 5 shows an auxiliary device comprising a shoulder piece 70 slidably engaging the upper end 71 of the stem 25 of the supporting member which is provided with a semi-spherical bearing 72 engaging the semi-spherical bearing 21 in the coupler shank and a secondary spring 74 is positioned between this piece 70 and the adjusting nut 75. This secondary device keeps the supporting member and coupler in engagement with each other when the coupler moves upwardly in service or when the car is turned upside down in an unloading machine and retards the entrance of foreign matter between those engaging surfaces which increases wear.

The accompanying drawing illustrates the pre-

ferred 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. A cushioning device for a railway car coupler comprising a car part provided with a horizontal portion having an aperture therein, a member provided with a stem with its lower end projecting through said aperture and with its upper end having a universal joint connection with the coupler, a coil spring surrounding the stem which rests upon said car part, and an adjusting means on the stem engaging the upper part of the spring to adjust the vertical elevation of the coupler, whereby a downward movement of the coupler compresses the spring.

2. A cushioning device for a railway car coupler comprising a car part provided with a horizontal portion having an aperture therein, a member provided with a stem with its lower end projecting through said aperture and with its upper end having a universal joint connection with the coupler, a coil spring surrounding the stem which rests upon said car part, an adjusting means on the stem engaging the upper part of the spring to adjust the vertical elevation of the coupler, whereby a downward movement of the coupler compresses the spring, and an adjusting means on the stem below the car part engaging the car part to adjust the compression of the spring.

3. A cushioning device for a railway car coupler comprising a car part provided with a horizontal portion having an aperture therein with a semi-spherical bearing surface surrounding said aperture on the lower surface of said portion, a member provided with a stem with its lower end projecting through said aperture and with its upper end having a universal joint connection with the coupler, a coil spring surrounding the stem which rests upon said car part, an adjusting means on the stem engaging the upper part of the spring to adjust the vertical elevation of the coupler, whereby a downward movement of the coupler compresses the spring, and an adjusting means on the stem below the car part engaging the semi-spherical bearing on the car part to adjust the compression of the spring.

4. A cushioning and centering device for a railway car coupler comprising a car part provided with a horizontal portion with a substantially flat bearing surface on the upper surface of said portion surrounding an aperture, a member provided with a stem with its lower end projecting through said aperture and with its upper end having a universal joint connection with the coupler, a coil spring surrounding the stem which rests upon said flat bearing surface, and an adjusting means on the stem engaging the upper part of the spring to adjust the vertical elevation of the coupler, whereby a downward movement of the coupler compresses the spring and a lateral movement of the coupler distorts the spring.

5. A cushioning and centering device for a railway car coupler comprising a car part provided with a horizontal portion with a substantially flat bearing surface on the upper surface of said portion surrounding an aperture and with a semi-spherical bearing surface surrounding said aperture on the lower surface of said portion, a member provided with a stem with its lower end projecting through said aperture and with its upper end having a universal joint connection with the coupler, a coil spring surrounding the stem which rests upon said flat bearing surface, an adjusting means on the stem engaging the upper part of the spring to adjust the vertical elevation of the coupler, whereby a downward movement of the coupler compresses the spring and a lateral movement of the coupler distorts the spring, and an adjusting means on the stem below the car part engaging the semi-spherical bearing on the car part to adjust the compression of the spring.

6. A cushioning device for a railway car coupler comprising a car part provided with a horizontal portion having an aperture therein, a member provided with a threaded stem with its lower end projecting through said aperture and with its upper end having a universal joint connection with the coupler, a coil spring surrounding the stem which rests upon said car part, an adjusting nut on the stem engaging the upper part of the spring to adjust the vertical elevation of the coupler, whereby a downward movement of the coupler compresses the spring and an adjusting nut on the stem below the car part engaging the car part to adjust the compression of the spring.

7. A cushioning device for a railway car coupler comprising a coupler provided with a semi-spherical bearing surface, a car part provided with a horizontal portion having an aperture therein, a member provided with a stem with its lower end projecting through said aperture and with its upper end provided with a semi-spherical bearing surface engaging the bearing surface of the coupler to form a universal joint therewith, a coil spring surrounding the stem which rests upon said car part, and means to transmit the downward movement of the stem to the spring, whereby a downward movement of the coupler compresses the spring.

8. A cushioning device for a railway car coupler comprising a coupler provided with a semi-spherical bearing surface surrounding a hole, a car part provided with a horizontal portion having an aperture therein, a member provided with a stem with its lower end projecting through said aperture and with its upper end provided with a semi-spherical bearing surface engaging the bearing surface of the coupler to form a universal joint therewith, said member provided with an extension projecting through said hole, a coil spring surrounding the stem which rests upon said car part, and means to transmit the downward movement of the stem to the spring, whereby a downward movement of the coupler compresses the spring.

9. A cushioning device for a railway car coupler comprising a coupler provided with a semi-spherical bearing surface, a car part provided with a horizontal portion having an aperture therein, a member provided with a stem with its lower end projecting through said aperture and with its upper end provided with a semi-spherical bearing surface engaging the bearing surface of the coupler to form a universal joint therewith, a coil spring surrounding the stem which rests upon said car part, and means to transmit the downward movement of the stem to the spring, whereby a downward movement of the coupler compresses the spring.

10. A cushioning device for a railway car coupler comprising a car part provided with a horizontal portion having an aperture therein, a member provided with a stem with its lower end

projecting through said aperture, a shoulder piece which slidably engages the upper end of said stem, a coil spring surrounding the stem, means to transmit the downward movement of the stem to the spring, and a secondary spring between said piece and said means, whereby a downward movement of the coupler compresses the spring and said piece follows the coupler upwardly independently of said coil spring.

11. A cushioning device for a railway car coupler comprising a car part, a member supporting the coupler, said member attached to the coupler for universal movement with the coupler, a coil spring which rests upon the car part, and means to transmit substantially vertical movements of the member to the spring, which means may also be used to adjust the vertical height of the coupler.

12. A cushioning device for a railway car coupler comprising a car part, a member supporting the coupler for universal movement therewith, a coil spring which rests upon the car part, means to transmit substantially vertical movements of the member to the spring, which means may also be used to adjust the vertical height of the coupler, and separate means to adjust the compression in the spring.

13. A cushioning and centering device for a railway car coupler comprising a car part, a member supporting the coupler for universal movement therewith, a coil spring which rests upon the car part, means to transmit substantially vertical movements of the member to the spring, which means may also be used to adjust the vertical height of the coupler, and separate means to adjust the compression in the spring.

14. A cushioning device for a railway car coupler comprising a car part provided with a horizontal portion having an aperture therein, a member provided with a stem with its lower end projecting through said aperture and with its upper end supporting the coupler, said member associated with the coupler for movement therewith in a substantially horizontal plane, yielding means resting upon said car part, and an adjusting means on the stem engaging the upper part of the yielding means to adjust the vertical elevation of the coupler, whereby a downward movement of the coupler compresses the yielding means.

15. A cushioning device for a railway car coupler comprising a car part positioned below the coupler, a member having one end associated with said car part so as to prevent horizontal movement of said end of said member though permitting vertical movement between the member and the car part, said member having the other end thereof supporting the coupler and associated therewith to move with the coupler in a horizontal plane, yielding means resting upon said car part, and means associated with said member to transmit downward movement of the coupler to the yielding means.

16. A cushioning device for a railway car coupler comprising a car part positioned below the coupler, a member having one end associated with said car part so as to prevent horizontal movement of said end of said member though permitting vertical movement between the member and the car part, said member having the other end thereof supporting the coupler and associated therewith to move with the coupler in a horizontal plane, yielding means resting upon said car part, and means associated with said member to transmit downward movement of the coupler to the yielding means, said means being adjustable to vary the vertical elevation of the coupler.

17. A cushioning device for a railway car coupler comprising a car part positioned below the coupler, a member having one end associated with said car part so as to prevent horizontal movement of said end of said member though permitting vertical movement between the member and the car part, said member having the other end thereof supporting the coupler and associated therewith to move with the coupler in a horizontal plane, yielding means resting upon said car part, means associated with said member to transmit downward movement of the coupler to the yielding means, and separate means to adjust the compression of the yielding means.

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