RAILROAD CAR COUPLER

Filed Oct. 5, 1942

Fig. 1.

Fig. 2.

Fig. 3.
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The object of the invention is to construct a vertical centering device for a coupler draft gear.

Another object of the invention is to construct a coupler draft gear whose parts are relatively axially movable and which is adapted for vertical alignment with respect to the car on which it is mounted and the cooperating coupler element.

A further object of the invention is to construct a coupler draft gear that is adapted to adjust itself for vertical misalignment.

A still further object of the invention is to provide a coupler draft gear in which the parts are separable and in which cooperating surfaces are formed about a common radius.

Other and further objects of the invention will occur to those skilled in the arts to which this invention pertains as the description proceeds which taken in connection with the accompanying drawings sets forth a preferred embodiment thereof, but such disclosure is not to be construed as a limitation of the invention which is limited only by the appended claims and it is distinctly understood that any and all modifications, alterations, and variations of structure coming within the spirit and scope thereof are deemed to be included herein.

In the drawings:

Fig. 1 shows a vertical section of the coupler draft gear in normal uncoupled condition.

Fig. 2 shows a horizontal plan view of the device with parts in section to show details of construction.

Fig. 3 is a view similar to Fig. 1 but showing more of the details in section.

Fig. 4 shows a plan view of one of the parts of the coupler.

Fig. 5 shows a side view of the coupling part turned 30 degrees from that shown in Fig. 4.

Fig. 6 shows a front or end elevational view of the part.

Fig. 7 shows the complementary part of coupling fitting the opposite end of the draft gear.

Fig. 8 is a view similar to Fig. 3 in which the centers are tilted 5 degrees in a vertical direction.

Railroad practice in the past has provided coupler mechanisms that achieve an alignment of the draft gear from any horizontally displaced position, but has not developed a completely efficient mechanism in which a vertical displacement or alignment of the draft gear with respect to the housing has been accomplished. Various expedients in the past have been adopted, but these have not proved satisfactory in that the parts were either too rigid to effect an alignment from the vehicle or else the mechanism was massive and extensive such as to preclude its use in commercial practice. Bearing the above ideas in mind the applicant has produced and developed an efficient and yet satisfactory draft gear that is capable of achieving an axial alignment of the shank of the draft gear with respect to its housing and which will restore the proper vertical alignment when displaced therefrom. The applicant has, therefore, provided the following structure hereinafter more specifically set forth.

In Fig. 1 there is shown the shank of a female coupler head, which is more particularly shown for example in U.S. Patent No. 2,380,357, that is pivotally mounted in a clevis casting 2 by means of a pivot or pin 3, such that the coupler has a controlled lateral movement about the pivot pin 3. A retaining means 3a is provided in the lower end of pin 3 to hold it in position in the clevis casting 2. The foregoing structure is substantially the same in character as previously developed structure and is well-known in the arts to which this invention pertains.

The clevis casting 2 is provided with a shank 4 on which is mounted a front follower block 5 and a rear follower block 6 in such a way that the shank 4 can axially slide back and forth inside of the openings in the follower blocks 5 and 6.

Shank 4 at its forward end is provided with a shoulder or collar element 7, and in its rear or opposite end it is provided with a slot 8 in which is inserted a bar or key 9 having its ends extending over the rear surface of rear follower block 6 so that a maximum separation between the front follower block 5 and the rear block 6 is limited by the distance between shoulder or collar 7 and the inside surface 10 of key 9. Bar or key 9 is held in place in the shank 4 against removal by a pin or rivet 8a.

Disposed between the front follower block 5 and the rear block 6 under a predetermined tension is a rather heavy coil spring 11 arranged in such a way that it tends to separate the follower blocks and thus keeps the front follower block 5 pressed up against shoulder or collar 7 and the rear follower block pressed up against the inside surface 10 of key 9.

The follower blocks 5 and 6 are substantially rectangular in shape as more particularly shown in Figs. 4 through 7 in so far as their projection...
from front or rear is concerned and their outside top and bottom corners are rounded into convex cylindrical surfaces having their axes coincident with horizontal lines that are normal to the coupler center line and extend to both sides of this center line. Thus corner surfaces 12 and 13 on front follower block 5 are cylindrical and have their axes at 14, and corner surfaces 15 and 16 on rear follower block 6 are cylindrical with their axes at 11.

The follower blocks 5 and 6 and the spring 11 are completely enclosed in a housing 10 that is rigidly attached to the vehicle for which the coupler device is provided and for convenience of assembly, the housing 10 may be made into 2 halves or parts and joined together at 19 by bolting or in any other convenient way the accomplishment of joining the parts is achieved by providing appropriate flanges on the housing portions 20 and 21 and inserting through an aperture thereina a bolt or screw element 22, the latter maintaining the housing parts in a predetermined fixed relationship. To prevent any possible relative movement of the parts to the vehicle or movement of the parts with respect to each other, the dividing line, or surfaces between the two are offset in different portions thereof, as indicated at 23. It is evident therefore, from the foregoing, that the portions of the housing are held in a fixed and positive relationship with respect to each other and therefore prevent any possible movement of one part of the housing relative to the other. The inside upper and lower corners of the front ends of the housing 10 have concave cylindrical surfaces that coincide with the previously mentioned convex cylindrical surfaces on the follower block and the dimensions of housing 10 are such that when the front surface of front follower block 5 is in contact with similar or collar 7 on shank 4 and at the same time that the rear follower block 6 is pressed against the inside surface 10 of key or bar 8 then all the convex cylindrical surfaces 12, 13, 15, and 16 are in contact with the corresponding concave cylindrical surfaces in the housing 10.

From the foregoing description and with specific reference to Fig. 1, it is evident that the coupler will be held in the horizontal position with the shank 4 disposed substantially axially of the housing 10 as long as the convex cylindrical surfaces 12, 13, 15, and 16 on the follower blocks 5 and 6 are held in contact with the corresponding concave cylindrical surfaces in housing 10 by reason of the tension in spring 11. It is evident that any tendency to displace the coupler from the horizontal position either up or down tends to move one of the follower blocks 5 or 6 in a direction against the tension of spring 11 and unless the force tending to move the coupler out of the horizontal position is sufficient to overcome the tension in spring 11 the coupler will remain in horizontal position.

Fig. 8 shows the shank of the coupler that has its axes deflected downward about 5 degrees under an external force sufficient to move the front follower block 5 backward against the tension of spring 11 and to further compress the spring 11. When, therefore, the external force is removed, the tension of spring 11 exerting itself against the follower block 5 will cause one of the surfaces thereof to engage the corresponding concave surface of the housing 10 in a form of a normal horizontal position.

It is further evident that if an external force presses upward on the coupler element the inverse of the foregoing action will take place, but the function of spring 11 will at all times tend to restore the axis of shank 4 to its normally horizontal position. By the same token should there at any time be an abnormal movement of the coupler housing with respect to the shank 4 the same action will take place. Regardless of where the external force originates the action of spring 11 will at all times tend to restore the axis of shank 4 to its normally horizontal position.

Figs. 4 through 7 as previously indicated show the front follower block with side view thereof in which Fig. 4 is rotated 90 degrees from Fig. 5 and Fig. 6 shows an end view of the follower such that the character and extent of surfaces is more clearly evident.

Fig. 7 shows a side view, of follower block 6 with a depression 52 at the outer end thereof. The bar or key 9 is adapted to seat therein and thus prevent any unintentional motion of the follower block 6 with respect to the bar or key 9.

That which is regarded new, novel, and useful and which is shown to be protected by Letters Patent of the United States is as follows:

1. In a railroad coupling, a housing for the draft gear thereof; a collar portion thereon near one end thereof; said draft gear having a shank whose axis extends substantially axially of said housing; follower blocks on said shank; one end of one of said blocks normally abutting said collar; a pin surface of the outer surface of said shank and the one end of the other follower block abutting said pin; a spring extending between said follower blocks and surrounding said shank; sawd follower blocks having substantially curved contact surfaces with said housing; the internal ends of said housing having a curved contact surface complementary to the curved contact surface of said follower blocks, the axes of curvature of the curved surfaces of said follower blocks lying along the axis of said shank; and said spring and curved contact surfaces restoring said shank to a normal horizontal position whenever displaced therefrom by an external force.

2. In a coupling draft gear; a separable housing therefor; a bar having a coupler clevis thereon, said bar and its axis extending axially of said housing; said housing having internal concave cylindrical surfaces at each end thereof the radii of which lie on the axis of said housing; follower blocks on said bar having convex cylindrical surfaces thereon concentric with said concave surfaces when said shank is in a horizontal position and adapted to engage said housing concave surfaces; the axis of curvature of said blocks lying on the axis of said shank; a spring on said bar extending between said follower blocks; and said follower block convex surfaces, said housing concave surfaces and said spring acting to restore said bar to its axial position whenever displaced therefrom.

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