A coupler uncoupling arrangement including a chain operating member. The chain operating member is guided in rigid guide struts pivotally connected to each other. At least one of the guide struts is suspended from the coupler while another of the guide struts is pivotally connected to the underframe.

6 Claims, 7 Drawing Figures
CHAIN AND STRUT COUPLER UNCOUPLING DEVICE

BACKGROUND — SUMMARY — DRAWINGS

The present invention relates to uncoupling mechanisms for unlocking railway car couplers. The advent of long travel cushioning wherein there is relative travel between 10 and 30 inches of the coupler and underframe requires that the uncoupling mechanism be constructed to accommodate these movements in a manner that eliminates inadvertent uncoupling, and at the same time provides effective coupling when required. Heretofore, the uncoupling devices for long travel cushioning have generally been constructed of telescoping components. Some efforts have also been made to utilize flexible components such as cabling or the like.

The telescoping component type of uncoupling mechanisms have been susceptible to damage because of their location on the railway vehicle. When damaged, these prior mechanisms were incapable of performing their functions properly. The flexible type of uncoupling devices have been subject to breakdown during adverse weather conditions such as that causing icing. When the prior art flexible devices are iced or frozen the force required to release the uncoupling mechanism can not be applied.

By the present invention it is proposed to provide an uncoupling mechanism which overcomes the difficulties encountered heretofore.

This is accomplished by the provision of a coupler uncoupling assembly which is constructed and arranged so as to be substantially entirely disposed beneath the underframe of the vehicle and the coupler. The uncoupling assembly includes a link connector which is connected at one end to an actuating handle mounted on the underframe and at the other end to the coupler unlocking mechanism. A guide assembly for guiding the link connector includes a plurality of struts pivotally connected to each other and to the underframe and the coupler unlocking mechanism. One of the guide means is disposed beneath the coupler so as to maintain a length of the link connector there beneath. A suspension chain serving as a hanger permits limited swinging and lengthwise movement of the coupler uncoupling assembly relative to the underframe as the coupler movement dictates.

Further features of the coupler uncoupling mechanism will hereinafter appear.

In drawings which illustrate embodiments of the invention,

FIG. 1 is a top view of the coupler uncoupling mechanism of the present invention shown mounted on a railway vehicle which is illustrated in phantom lines to show underlying details of structure of the coupler uncoupling mechanism.

FIG. 2 is a side elevational view taken generally along the lines 2—2 of FIG. 1 and showing details of structure at the uncoupling mechanism actuating handle.

FIG. 3 is a cross-sectional view taken generally along the lines 3—3 of FIG. 1 and showing the manner in which the coupler uncoupling mechanism is mounted on the underside of the coupler with the components shown in the locked position.

FIG. 4 is a view similar to FIG. 3 but showing the components in the coupler unlocking position.

FIG. 5 is a top plan view showing the typical pivot connection of the link connector guides of the coupler uncoupling mechanisms.

FIG. 6 is a side elevational view of FIG. 5 taken generally along the line 6—6 thereof.

FIG. 7 is an enlarged side elevational view of the coupler pivot operating mechanism at the coupler mounted end of the coupler uncoupling mechanism.

Referring now to the drawings the coupler uncoupling assembly 10 of the present invention is shown mounted on the underside of the underframe of a railway vehicle 12. The railway vehicle 12 is of conventional structure and includes a center sill 13 having bell mouth opening 14. Supported in the center sill 13 is a coupler 16 having a coupler shank 17 and a coupler head 18. The coupler head 18 includes a lock lift assembly that coacts with the coupler lock for coupling another coupler during locking. The lock lift is actuated in the conventional manner so that a further description is not deemed necessary.

The coupler 16 may be mounted on a sliding sill or a long travel draft gear device. In both cases the coupler 16 is attached to the sill by means of a coupler pivot pin 19 which serves to permit swinging of the coupler head 18 which projects outward of the bell mouth opening 14. The center or sliding sill in which the coupler 16 is mounted is conventionally of substantially hat shaped cross-section having a pair of laterally spaced side webs defining an open space therebetween.

The coupler uncoupling mechanism 10 of the present invention comprises generally a link connector drive 22 which is disposed beneath the underframe 11 and the coupler 16 so as to be protected against impact during uncoupling or coupling of the railway vehicles. The link connector drive 22 is disposed in a guide arrangement 23 including a plurality of pivotally connected members 24, 26 and 27 of which one member 27 is mounted beneath the underside of the coupler 16 to guide the link connector for the lengthwise movement. The link connector drive is connected at one end to the coupler locklift assembly 28 and at the other end to an actuating handle assembly 29.

The actuating handle assembly 29 as shown in FIG. 2 includes a generally L-shaped handle 31 and is fixed at one end to a pivot shaft 32. The pivot shaft 32 is pivotally supported adjacent one corner of the underframe end sill by means of a bracket 34. The long leg 36 of the actuating handle 31 serves as a hand grip so that the handle 31 may be pivoted to the phantom line position in which position the coupler is unlocked as more fully to be explained hereinafter. It is to be noted that the actuating handle 31 returns to the normal position shown in full lines by the force of gravity.

The link connector drive 22 in accordance with the present invention is made of chain so as to be capable of withstanding the abuse associated with the use in a railway car. The chain 22 is connected at one end to a closed U-link 37 fixed to the handle 31. The other end of the chain 22 is fixed to a stud 38 of a pivoted lever arm 39 which serves to actuate the locklift assembly as more fully to be explained hereinafter.

Supporting and guiding the chain between the actuating handle and the pivoted lever arm is the guide arrangement 23 including the first guide member 24 extending rearwardly beneath or adjacent the side sill of the underframe, the second guide member 26 extending inboard from the first guide member 24, and a third
or coupler guide member 27 extending beneath the coupler 16 and supported for movement therewith. As shown, each of the first, second and third guide members is in the form of hollow open ended tubes or struts. The open ended structure prevents the accumulation of water and thereby icing.

As shown in FIG. 2 the outer end of the first strut 24 is fixed to an attachment clevis 41. The attachment clevis 41 is mounted for turning movement in a horizontal plane about a vertical pivot pin 42 fixed to the bracket 34. Also disposed on the attachment clevis 41 is a guide roller 43 about which the chain 22 is trained.

The opposite end of the strut 24 is pivotally connected to the adjacent end of the generally transversely extending strut 26 as shown in FIGS. 5 and 6. A pair of vertically spaced plates 44–44 are fixed to the ends of the strut 26. The plates 44–44 accommodate theerebetween a pair of substantially square plates 46–46 fixed to the adjacent end of the strut 26. The plates 44–44 and plates 46–46 are pivotally connected by a pin 47 fixed to the plates 44–44 and passing through in the plates 46–46. Pins 47 are located on the centerline of the chain so that the struts remain of constant length relative to the chain. Turnably supported between the plates 46–46 is another guide roller 43 for the chain 22. The opposite end of the strut 26 is connected to the coupler guide strut 27 in the same manner as illustrated in FIGS. 5 and 6 so that a further description is not deemed necessary.

The coupler guide strut 27 is supported adjacent its rear end by a length of chain 48 or the like. The length of chain 48 serves as a hanger and permits movement of the guide arrangement 23 independently of the underframe 11. The chain or hanger 48 is connected to a U-bolt 49 suitably fixed to the strut 27 at the other end. The hanger 48 is connected to strap 51 which is secured about the coupler shank 17. The hanger 48 thus serves to suspend the guide means from the coupler 16.

A support angle iron 52 having a vertical leg 53 and a horizontal leg 54 is fixedly secured along one side of the coupler guide strut 27 at its other end. Pivotally attached to a trunnion 55 fixed to the free end of the angle iron 52 by means of a pivot stud 56 is the lever arm 39. The pin or stud 38 is fixed to the upper end of the lever arm 39 and secures the end of the operating chain 22. Another chain guide roller 43 may be located on the vertical wall 53. Cradled and mounted in a concave boss 56 fixed to the lever arm 39 is an actuating pin 57 which is received in the coupler lock-lift assembly 28.

In the full line position of FIG. 7 the actuating pin 57 is received in the lock-lift assembly 28 thereby retaining the coupler uncoupling assembly in the position shown. The uncoupling assembly is free to swing and move with the coupler independently of the underframe as the angular swinging and lengthwise travel of the coupler dictates. This freedom of movement is achieved by the pivotal connection of the uncoupling assembly guide arrangement 23, at the end sill 33, and the hanger 48 and the connection at the lock-lift assembly. Moreover, each of the rigid struts 24, 26 and 27 are pivotally connected to each other and to the underframed 11 so that limited relative movement is possible as dictated by the movement of the coupler 16.

To unlock or uncouple the coupler, the actuating handle 31 is turned counterclockwise as viewed in FIG. 2 to the phantom line position. This causes a pulling force to be exerted through the chain 22 which is trained over the guide rollers 43 to the end of the lever arm 39. The lever arm 39 is caused to be rocked to the phantom line position shown in FIG. 7. As explained heretofore in the depressed or lower position of the lever arm the coupler lock-lift mechanism 28 is released so that an adjacent coupler may be freed in the usual manner.

After uncoupling, the weight of struts 24, 26 and 27, chain 22 and handle 31 is such that the coupler uncoupling assembly returns to the full line position by the force of gravity alone. This eliminates the need for the chain to do any pushing because the chain is only in tension during the unlocking operation.

From the foregoing it is believed one skilled in this art will clearly understand how the invention operates.

I claim:

1. A mechanism for unlocking the coupler lock mechanism of a coupler mounted on the underframe of a railroad vehicle, said coupler uncoupling mechanism comprising a chain link connector extending beneath said underframe; means connecting one end of said link connector to said coupler lock mechanism, means connecting the other end of said link connector to a rotatable handle, guide means for guiding said link connector from said handle to said coupler unlocking means, said guide means comprising a plurality of open-ended struts through which said chain extends, and means pivotally connecting said struts for pivotal movement in a substantially horizontal plane, said struts being pivotally connected to said underframe and suspended from said coupler so as to be independently movable relative to said underframe during swinging and lengthwise movement of said coupler, said chain link connector being operative to rotate said coupler unlocking means to an unlocked position.

2. The invention as defined in claim 1 wherein said plurality of struts includes a first strut connected at one end to said underframe adjacent said handle, a second strut pivotally connected at one end to the other end of said first strut and a third strut disposed beneath said coupler and pivotally connected at one end to said second strut.

3. The invention as defined in claim 2 wherein a lever arm is pivotally secured to said other end of said third strut means, an actuating pin mounted on said lever arm for movement therewith and engageable with said coupler unlocking means, and wherein said chain is connected to said lever arm so that upon turning of said actuating handle said chain is pulled so that said lever arm is rotated to unlock said coupler unlocking mechanism.

4. The invention as defined in claim 1 wherein said guide means includes a plurality of guide rollers for guiding said chain for movement independently of said guide means.

5. A mechanism for unlocking the coupler lock on a railroad car coupler, said mechanism comprising a series of pivotally connected struts, a guided chain located within the confines of said struts, one end of said chain being connected to an arm attached to the lock-lift assembly, and the other end of said chain being connected to an operating handle, each of the pivot connections between adjacent struts being located on the vertical centerline of said chain so that the struts remain of constant length relative to said chain, whereby a pull on the operating handle will pull the chain and
actuate the arm attached to the lock-lift assembly and thereby unlock the coupler.

6. A mechanism to unlock the coupler of a railroad car, said mechanism comprising a series of struts pivotally connected to each other, a guided chain operable within said struts, one end of said struts being pivotally connected to a hook attached to the lock mechanism of the coupler, said chain being connected at one end to a second point on the hook, and at the other end to a handle on the car frame, the other end of the struts being connected to the car frame, whereby a pull on the handle will move the chain relative to the series of struts and unlock the coupler.

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