Feb. 12, 1952 H. H. WOLFE 2,585,889

COUPLER OPERATING MECHANISM

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Fig. 1.

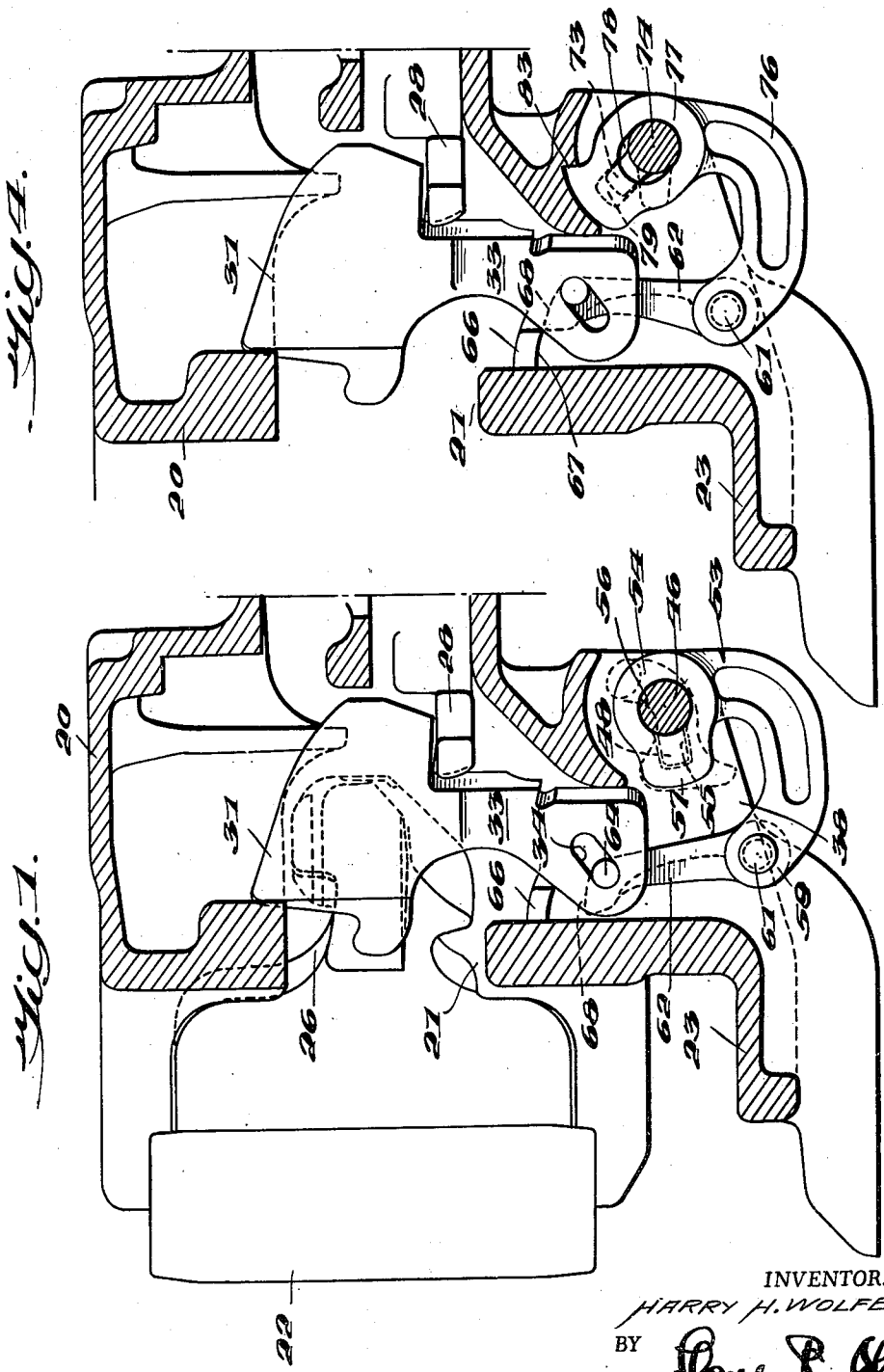


Fig. 4.

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COUPLER OPERATING MECHANISM

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Fig. 3.

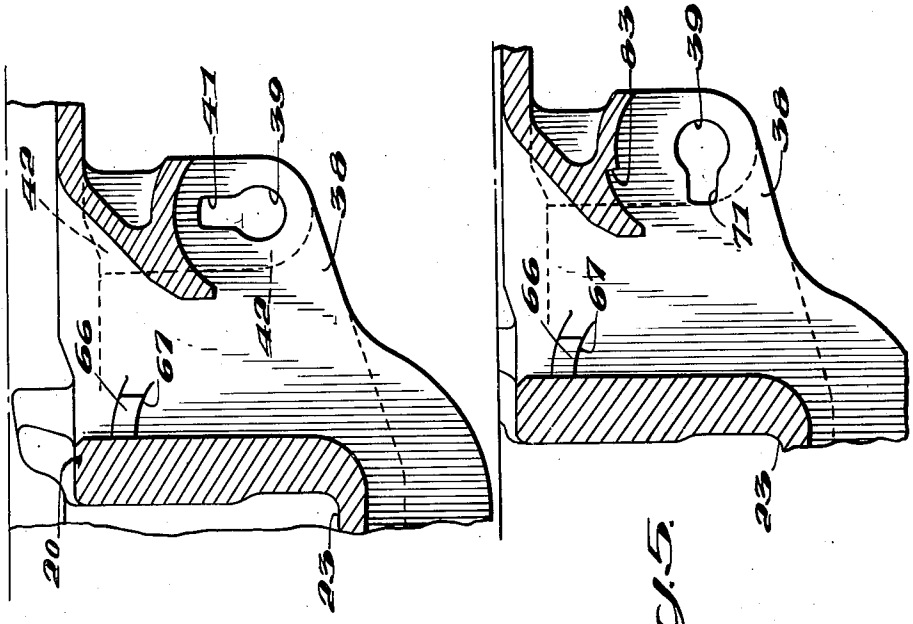


Fig. 5.

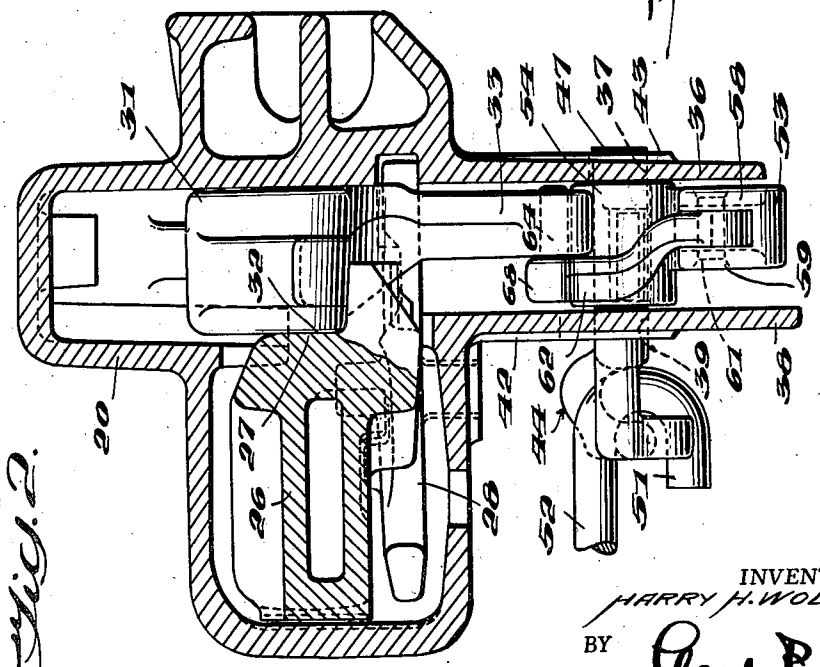


Fig. 2.

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COUPLER OPERATING MECHANISM

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Fig. 7.

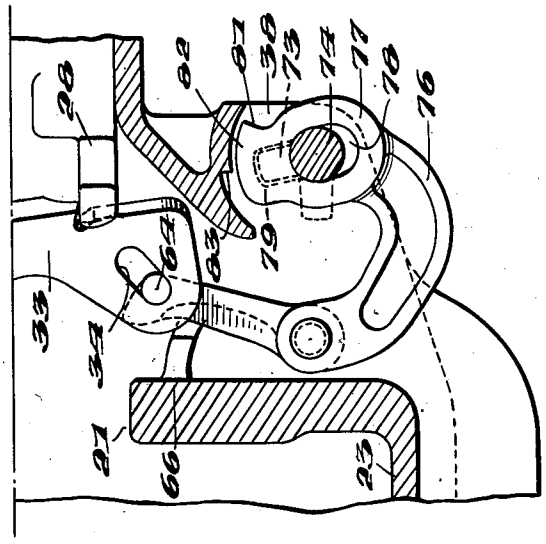


Fig. 10.

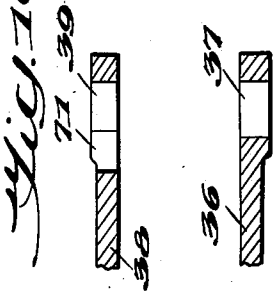


Fig. 9.

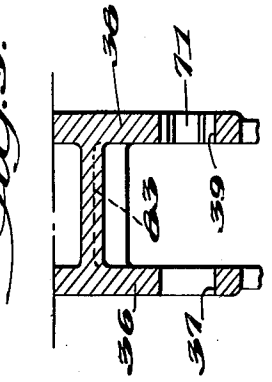


Fig. 6.

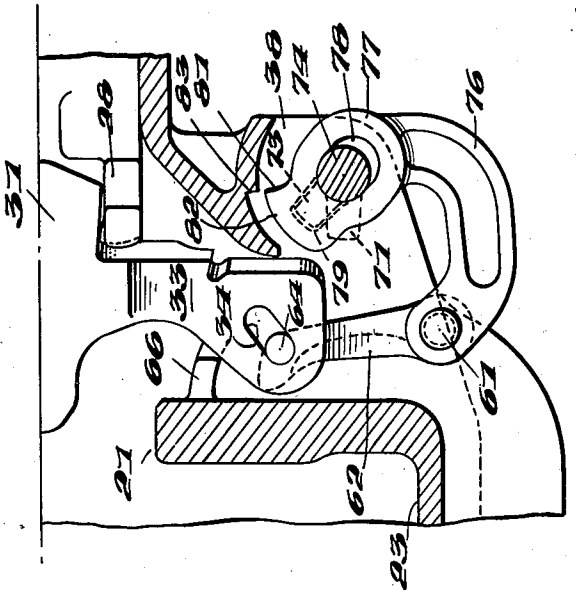
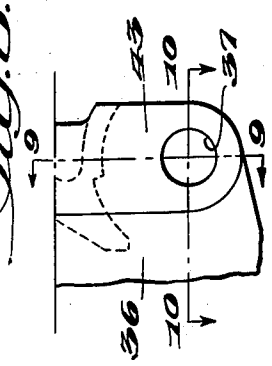


Fig. 8.



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COUPLER OPERATING MECHANISM

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Fig. 16.

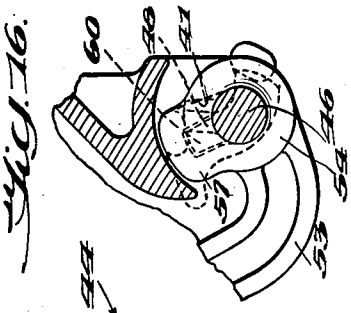


Fig. 13.

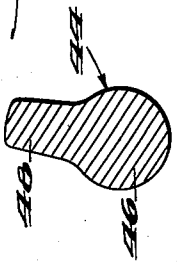


Fig. 14.

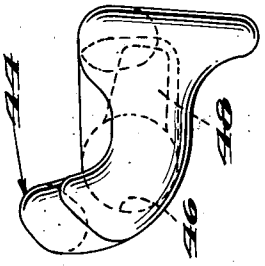


Fig. 11.

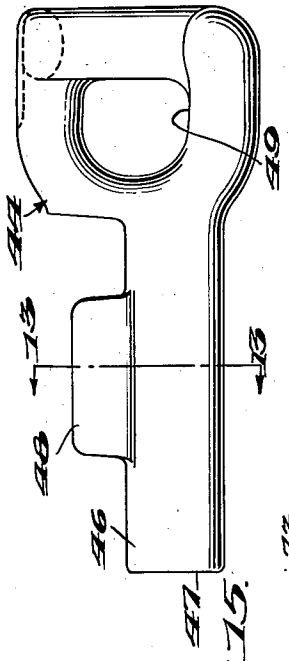


Fig. 12.

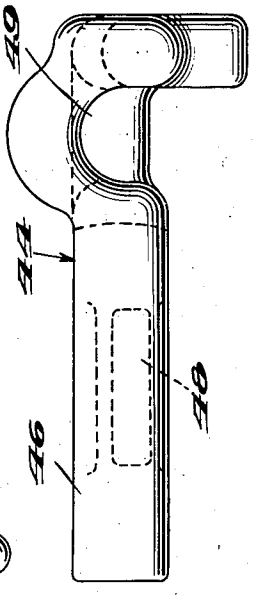
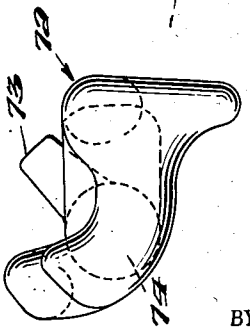


Fig. 15.



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Patented Feb. 12, 1952 2,585,889

UNITED STATES PATENT OFFICE

2,585,889

COUPLER OPERATING MECHANISM

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Application August 9, 1949, Serial No. 109,318

2 Claims. (Cl. 213—148)

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The present invention relates to railway car couplers and more specifically relates to improvements in the mechanism for manipulating and controlling movement of the lock of such coupling devices.

One type of operating mechanism for the lock of a railway car coupler which has been used in the past included a rotor lever of the hook type. Such a rotor lever provides a complicated and difficult casting to make and finish. The rotor assembly in such a coupler operating mechanism is also supported at a relatively high position on the coupler head and such a supporting position of the rotor assembly is desirable in the earlier types of couplers for clearance purposes but the high location is not conducive for facilitating the return of the lock to the locked position. A railway car coupler embodying the hook type rotor lever includes a rod eye lug for the operating rod outside the hook bearing which tends to cause binding of the rotor parts and therefore interferes with proper operation of the lock lifting mechanism.

One of the objects of the invention is to provide a novel construction of the rotor and rotor lever for the operating mechanism of a car coupler of the knuckle type and to simplify the casting and finishing of such elements of the lock manipulating mechanism and to provide a structural arrangement of the rotor and the rotor lever so as to prevent inadvertent disconnection of the rotor from the coupler head during normal operation.

Another object of the invention is to provide a lock operating mechanism for a railway car coupler wherein the degree of rotation of the operating rod has been materially reduced and to provide a rotor lever for the operating mechanism to assure more positive movement of the parts to the locked position of the coupler.

A still further object of the invention is to provide an improved operating mechanism for the lock of a railway car coupler which may be employed with a minimum of changes in an existing coupler head and other parts of the coupling device.

Other objects and features of the invention will be more apparent to those skilled in the railway coupler art as the present disclosure proceeds and upon consideration of the accompanying drawings and the following detailed description wherein several exemplary embodiments of the invention are disclosed.

In the drawings:

Fig. 1 is a vertical longitudinal sectional view

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of a railway car coupler embodying the invention showing the position of the operating mechanism in the fully locked position.

Fig. 2 is a transverse sectional view of the structure shown in Fig. 1 showing the lock operating assembly in front elevation.

Fig. 3 is a fragmentary sectional view showing the arrangement of the opening and slot in the rib on the knuckle side of the coupler.

Fig. 4 is a view similar to Fig. 1, showing a modification of the rotor and rotor lever including secondary anticreep means associated therewith.

Fig. 5 is a fragmentary sectional view showing the opening and slot arrangement in the rib on the knuckle side of the coupler for the operating mechanism shown in Fig. 4.

Fig. 6 is a fragmentary sectional view showing the operating mechanism of Fig. 4 with the parts in a fully locked position and the secondary anticreep in an inoperative position.

Fig. 7 is a similar view with the elements of the coupler operating mechanism in the lockset position.

Fig. 8 is a fragmentary side elevational view of the lug on the guard arm side of the coupler.

Fig. 9 is a sectional view taken on the line 9—9 of Fig. 8.

Fig. 10 is a sectional view taken on the line 10—10 of Fig. 8.

Fig. 11 is a plan view of the rotor forming a part of the operating mechanism of the embodiment shown in Figs. 1 and 2.

Fig. 12 is a side elevational view of the rotor shown in Fig. 11.

Fig. 13 is a sectional view taken on the line 13—13 of Fig. 11.

Fig. 14 is an end elevational view of the rotor shown in Fig. 11.

Fig. 15 is an end view of the rotor embodied in the operating mechanism of Figs. 4, 6 and 7.

Fig. 16 is a fragmentary sectional view of the operating mechanism shown in Fig. 1 with the parts in the full knuckle throw position of the lock.

Referring to the drawings, there is shown at 20 a coupler head which may be of any well-known design provided with a front opening 21 through which the tail portion of the knuckle extends. The knuckle is illustrated at 22 and is adapted to turn about the axis of a vertically disposed knuckle pin (not shown) in the usual manner. The coupler head may be provided with a shelf 23 below the knuckle 22 as shown in Fig. 1. The knuckle tail 26 is provided with a lock engag-

ing face 27, as depicted in Fig. 2. The knuckle is adapted to be swung to the open position by a knuckle thrower 28 of conventional design mounted in the usual manner for cooperation with the lock to turn the knuckle to an open position when the lock is raised to the fully unlocked position. The lock 31 is also of conventional shape and design and is provided with a face 32 (Fig. 2) which is arranged in a substantially vertical plane for being engaged by the surface 27 on the knuckle tail to retain the knuckle in the closed position. The lock includes a leg portion 33 which is adapted to depend into the throat of the coupler head. A slot 34 of elongated shape and inclined with respect to a horizontal position is provided in the lower end portion of the lock leg 33. The lock in the fully locked position as shown in Figs. 1 and 2 bears at one face against the lock housing and the face 27 on the knuckle tail engages the lock face 32 to prevent the knuckle 22 from turning about the axis of the knuckle pin to the open position. The details of elements thus far described may be more clearly understood upon reference to my copending application, Serial No. 15,020, filed March 15, 1948, now Patent No. 2,568,312.

A railway car coupler exhibiting the invention includes a rib 36 on the guard arm side of the coupler which forms a continuation of one of the ribs which supports the shelf 23. This extended rib or lug 36 is provided with a circular opening 37 as shown in dotted lines in Fig. 2 and in full lines in Fig. 8. Another rib 38 is provided on the knuckle side of the coupler head which forms an extension of another of the ribs which support the shelf 23. This rib 38 is more clearly shown in Fig. 3 and is provided with a hole 39 of circular configuration and horizontally aligned with the opening 37 in the lug or rib 36. A notch or slot 41 is provided in the lug or rib 38 adjacent the opening 39. This notch 41 is in open communication with the opening 39 and is radially disposed with respect to the axis of the opening 39. The notch 41 is positioned with its center line approximately in the twelve o'clock position as will be evident upon consideration of Fig. 3. The area of the rib 38 adjacent the opening 39 may be reinforced by means of an additional metal as represented at 42. Similar reinforcement may be provided on the rib 36 in the vicinity of the opening 37 as indicated at 43 in Fig. 2.

The operating mechanism for the coupler includes a rotor 44 as best shown in Figs. 11 to 14. The rotor is provided with a shaft portion 46 of cylindrical formation which is adapted to extend through the opening 39 and the opening 37 in the ribs 38 and 36. The end 47 of the rotor is first inserted in the opening 39 from the knuckle side of the coupler and extends through the space between the ribs 38 and 36 and occupies the position as shown in Fig. 2. The rotor is then journaled for rotation in the bearings provided by the cylindrical portion of opening 39 and the opening 37. The rotor carries a lug 48, as more clearly shown in Figs. 11 and 13 projecting radially from the shaft portion 46. The lug 48 is of such dimensions as to pass freely through the notch 41 provided in the rib 38 in association with the opening 39. The rotor is provided with an eye lug 49 at the end thereof for receiving a hook shaped end 51 to an operating rod 52. The organization of these elements is illustrated in Fig. 2.

The coupler operating mechanism includes a rotor lever 53. This lever is substantially C-shaped in general outline as will be evident upon consideration of Fig. 1. The rotor lever 53 is provided with a hub portion 54 of such a length as to fit between the inner faces of the ribs 36 and 38 as shown in Fig. 2. The hub 54 is provided with a cylindrical opening 56 for receiving the shaft portion 46 of the rotor 44. The hub 54 is provided with a radial enlargement 57 as shown in Fig. 1, having a slot 55 therein of slightly larger dimensions than the lug 48 for receiving this projection and thereby keying the rotor shaft 46 to the rotor lever 53. The free end of the rotor lever is provided with spaced ears 58 and 59 having a hole extending therethrough.

A toggle 62 shaped in accordance with the toggle disclosed in my copending application, Serial No. 15,020, is attached to the free end of the rotor lever 53 by means of a rivet 61 which extends through the ears 58 and 59 to provide a relatively loose coupling of the lower end of the toggle 62 with the rotor lever. A trunnion 64 carried by the toggle extends laterally from the upper end thereof through the slot 34 in the leg of the lock thereby providing an operating connection between these elements. An anticreep lug 66 having an arcuate under surface 67 extends into the throat of the coupler head. This anticreep lug is adapted to be engaged by the nose 68 of the toggle and prevent inadvertent upward movement of the lock to an unlocked position. The lug 66 and the nose portion 68 of the toggle constitutes primary anticreep means for the lock of the coupler.

The operating mechanism for the lock as shown in Figs. 1 and 2 may be assembled by first attaching the toggle 62 to the free end of the rotor lever 53 by applying the rivet 61. The hub portion 54 of the rotor lever may then be introduced into a position between the ribs 36 and 38 with the opening 56 in alignment with the openings or holes 37 and 39. In this aligning operation the notch 55 in the hub of the rotor lever is oriented to the twelve o'clock position so that the slot 55 is in alignment with the notch 41. The rotor 44 may then be inserted by first introducing the end 47 into the opening 39 from the knuckle side of the coupler. The shaft portion 46 then enters the cylindrical opening 39 passes through the opening 56 in the rotor lever and enters the circular opening 37 provided in the rib 36. During this operation the lug 48 on the rotor first enters the notch 41 and then passes into the slot 55 in the rotor lever. When the rotor is fully inserted as illustrated in Fig. 2, the lug 48 is located wholly between the ribs 36 and 38 whereby the shaft portion 46 of the rotor may rotate in the cylindrical openings in the ribs 36 and 38. The toggle 62 is then raised and the lock 31 is threaded through the opening 21 with the lock leg 33 entering first. The lock may then be arranged with the slot 34 receiving the trunnion 64 of the toggle. The knuckle thrower 28 is then applied and the lock 31 and other operating parts are moved to the lockset position. The knuckle 22 is then arranged in position and the knuckle pivot pin (not shown) is assembled to maintain the knuckle in association with the coupler.

Thereafter as the knuckle 22 is moved to the closed position the lock 31 moves downwardly to the position shown in Figs. 1 and 2, and the toggle and rotor lever assume the positions illustrated in Fig. 1. The nose 68 of the toggle is then in a position under the anticreep lug 66 to prevent inadvertent dislodgement of the lock from the locked position as a result of bumps or

jolts in the operation of the railway vehicle. When it is desired to lift the lock 31 for an uncoupling operation the operating rod 52 is rotated to turn the rotor and the shaft portion 46 in a clockwise direction from the position shown in Fig. 1. Such rotation of the rotor 44 will swing the rotor lever 53 since the lug 48 engages a wall of the slot 55 to move the free end of the rotor lever upwardly and raise the lock 31. The rotor lever and the rotor assume the position shown in Fig. 16 in the full knuckle throw position where the knuckle thrower 28 has been actuated to swing the knuckle 22 to an open position.

The lug 48 then assumes the position as depicted in Fig. 16 and it will be observed that this position of the rotor does not provide for full alignment of the lug 48 with the notch 41 as evident by the overlapping area 60 in Fig. 16. Thus during normal operation of the lock, it is impossible for the rotor 44 to be withdrawn from the lugs or ribs 36 and 38.

It will be apparent that the structure of the rotor is materially simplified with regard to rotors of the prior art. The degree of rotation of the operating lever 52 is materially reduced by the present design of the rotor and hub of the rotor lever which requires only seventy three degrees of rotation of the rotor from the fully locked position to that of the full knuckle throw position of the lock.

A modification is illustrated in Figs. 4 to 7 and Fig. 15, wherein secondary anticreep means is provided in association with the rotor and rotor lever. In this embodiment, the rib or lug 38 is provided with a notch 71 with the center line thereof in the nine o'clock position as illustrated in Fig. 5. The rotor 72 for the operating mechanism of this embodiment is provided with a lug 73 having an altered position in relation to the shaft portion 74 of the rotor as shown in Fig. 15. The opening 37 in the rib 36 in this modification remains cylindrical or circular as shown in Fig. 8 and the overall structure of the remainder of the rotor remains like that described in connection with the first embodiment.

The rotor lever 76 is provided with a hub portion 77 having an elongated slot 78 therein and this slot is provided with a radially disposed notch 79 for receiving the lug 73 on the shaft portion 74 of the rotor 72. In this modification a surface 81 is provided on a hub projection 82 of the rotor lever which is arranged in a substantially radial plane with respect to the axis of the shaft portion 74 of the rotor. This surface 81 provides a part of the secondary anticreep and is adapted to cooperate with a shoulder 83 formed as an integral part of the coupler casting. In this embodiment the rotor lever 76 is connected to the toggle 62 by means of the rivet 61. The nose 68 of the toggle is adapted to engage the arcuate under surface 67 of the anticreep lug 66 and prevent the lock 31 from being jolted from the fully locked position. The lock leg 33 is also connected to the toggle as in the first embodiment by means of the journal pin 64. The operating mechanism in this modification is assembled in a manner similar to that described in connection with the first embodiment except that the rotor 72 and the shaft portion 74 thereof are applied when the rotor lever 76 is in a position lower than its normal operating or locked position as illustrated in Fig. 6. Thus when the lock is in the fully locked position as shown in Fig. 6 the lug 73 is not aligned with the notch 71 and the rotor shaft 74 cannot be withdrawn.

During normal operation of the coupler with the lock 31 in fully locked position as shown in Fig. 6, the surface 81 on the hub of the rotor lever 76 is out of engagement with the stop shoulder 83. This position of the rotor lever 76 on the shaft portion 74 of the rotor results from the weight of the rotor lever causing it to slide downwardly on the shaft portion 74 as permitted by the elongated slot 78. In this position of the parts the rotor shaft 74 may be turned and the rotor lever 76 being keyed thereto by means of the lug 73 will be turned in a clockwise direction and the lock 31 may be lifted. If there is a bouncing and an end shock of the railway vehicle and such movements take place substantially simultaneously the hub portion 77 of the rotor lever 76 will be thrown forwardly and upwardly and this movement of the hub portion is permitted by the slot 78. The hub portion 77 then assumes the position as shown in Fig. 4. The surface 81 then engages the shoulder 83 and prevents swinging movement of the rotor lever 76 and thereby prevents the lock 31 from jumping to an unlocked position. The lug 73 is then inclined to the horizontal at about forty-five degrees. It will be observed that the secondary anticreep means functions only during simultaneous bouncing and end shock and therefore supplements the anticreep means provided by the nose 68 of the toggle 62 and the anticreep lug 66.

While the invention has been described with reference to specific structural features and with regard to one general organization of a coupler operating mechanism, it will be understood that changes may be made in the shape and details of the elements as well as in the combination. Such modifications and others may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

What I claim and desire to secure by Letters Patent is:

1. In an operating mechanism for the lock of a knuckle-type railway car coupler, a coupler head, a rib depending from the coupler head and arranged longitudinally thereof, said rib having a circular opening therein provided with a notch communicating therewith located substantially in a twelve o'clock position, a second rib depending from said coupler head and arranged substantially parallel to the first rib, said second rib having a circular opening therein horizontally aligned with the circular opening in the first rib, a rotor lever, a hub carried by the rotor lever extending between said ribs, said hub having a cylindrical opening therethrough, an enlarged radially disposed portion on the hub having a radially disposed slot enclosed therein communicating with the cylindrical opening in the hub, a rotor including a cylindrical shaft portion extending through the cylindrical opening in the hub of the rotor lever and journaled for rotation in the cylindrical openings of said ribs, and a lug carried by the rotor extending into the radially disposed slot in the hub.

2. In an operating mechanism for the lock of a knuckle-type railway car coupler, a coupler head, a rib depending from the coupler head and arranged longitudinally thereof, said rib having a circular opening therein provided with a radially disposed notch communicating therewith and located substantially in a twelve-o'clock position, a second rib depending from said coupler head and arranged substantially parallel to the first rib, said second rib having a circular opening therein horizontally aligned with the circular opening

in the first rib, a hub extending between said ribs, said hub having a cylindrical opening therethrough, an enlarged radially disposed portion on said hub having a radially disposed slot enclosed therein communicating with the cylindrical opening in the hub, a rotor including a cylindrical shaft portion extending through the cylindrical opening in said hub and journaled for rotation in the cylindrical openings of said ribs, a lug carried by the rotor extending into the radially disposed slot in said hub, and a C-shaped lever integrally joining said hub at a zone circumferentially displaced from the enlarged portion by about ninety degrees.

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