Nov. 6, 1956 W. J. METZGER 2,769,556

CAR COUPLER

Filed Jan. 4, 1954 3 Sheets-Sheet 1

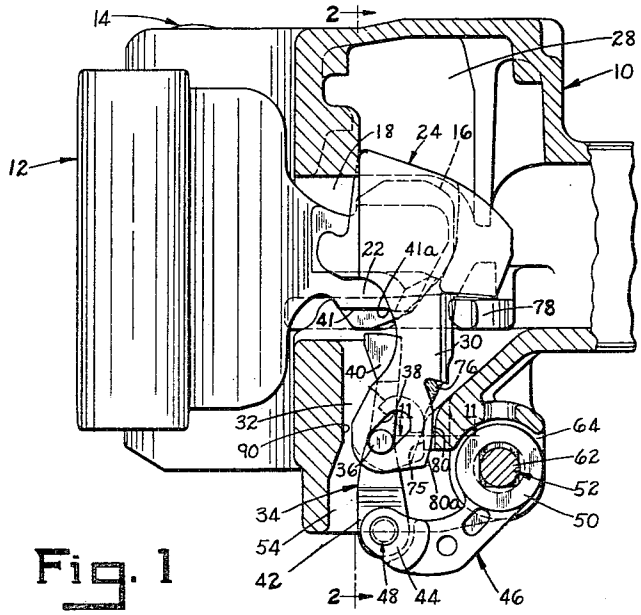


Fig. 1

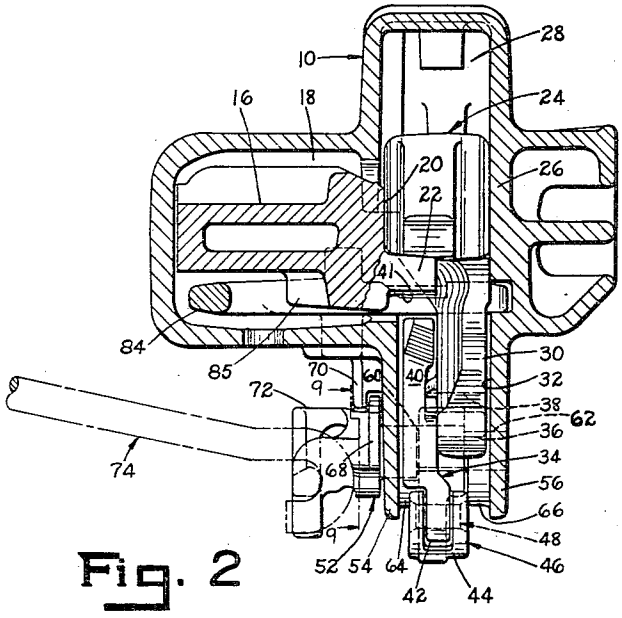


Fig. 2

INVENTOR.
WILLIAM J. METZGER
BY Henry Kozak
ATTORNEY

Nov. 6, 1956 W. J. METZGER 2,769,556

CAR COUPLER

Filed Jan. 4, 1954 3 Sheets-Sheet 2

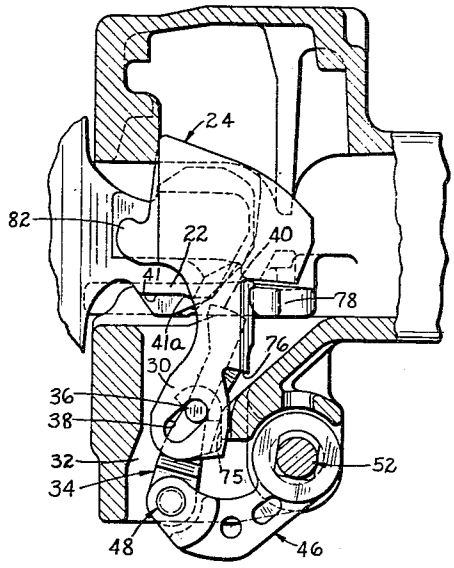


Fig. 3

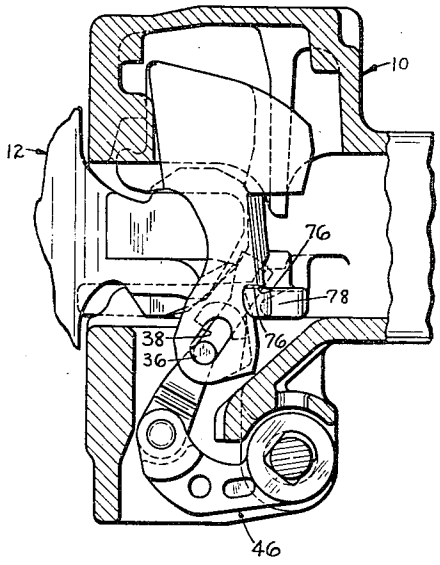


Fig. 4

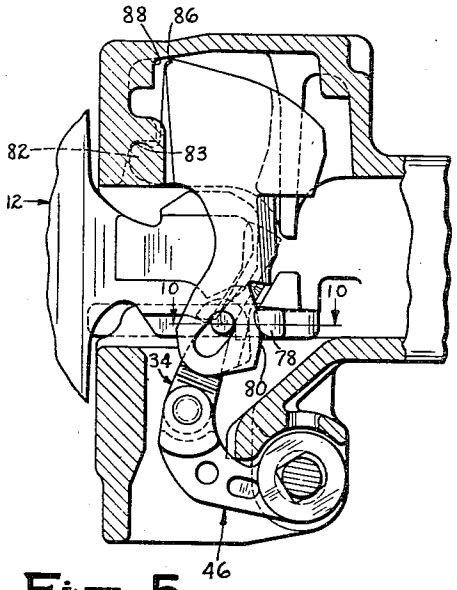


Fig. 5

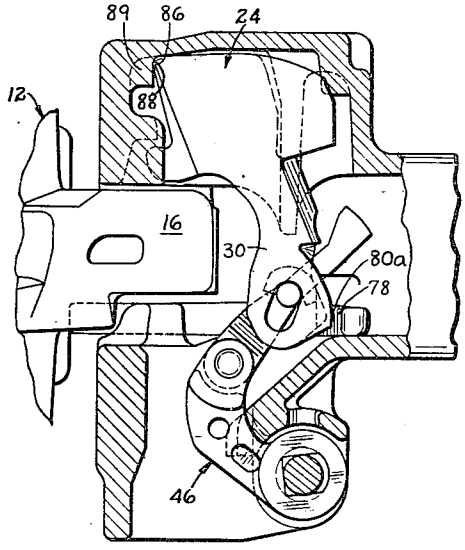


Fig. 6

INVENTOR.
WILLIAM J. METZGER
BY Henry Kozak
ATTORNEY

Nov. 6, 1956 W. J. METZGER 2,769,556

CAR COUPLER

Filed Jan. 4, 1954 3 Sheets-Sheet 3

Fig. 7

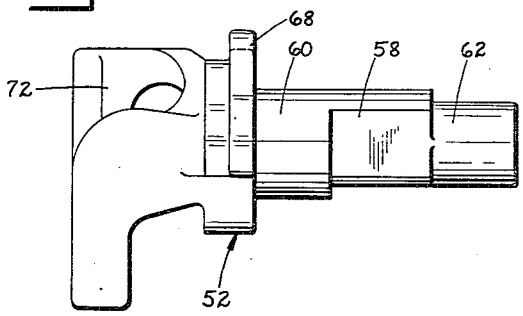


Fig. 8

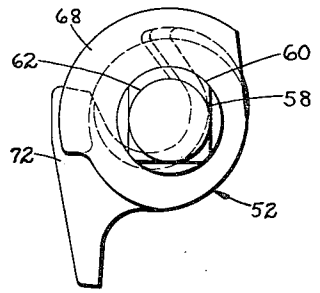


Fig. 9

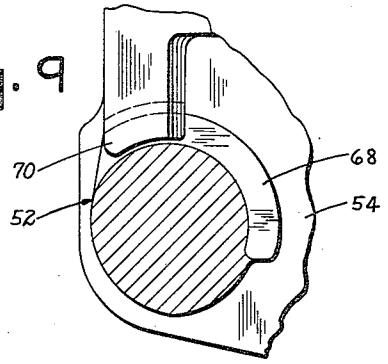


Fig. 10

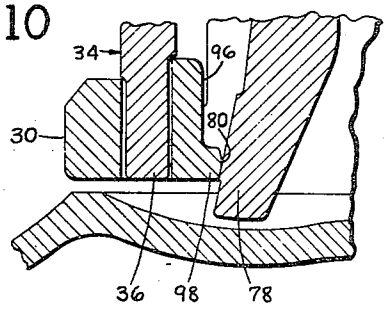
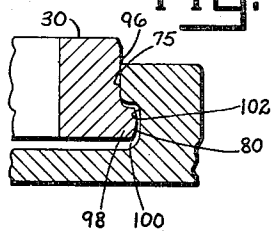


Fig. 11



INVENTOR.
WILLIAM J. METZGER
BY Henry Kozak
ATTORNEY

United States Patent Office 2,769,556 Patented Nov. 6, 1956

2,769,556

CAR COUPLER

William J. Metzger, East Cleveland, Ohio, assignor to National Malleable and Steel Castings Company, Cleveland, Ohio, a corporation of Ohio

Original application November 3, 1949, Serial No. 125,323, now Patent No. 2,709,007, dated May 24, 1955. Divided and this application January 4, 1954, Serial No. 401,895

8 Claims. (Cl. 213—127)

This is a divisional of the patent application of William J. Metzger, Serial No. 125,323, filed November 3, 1949 now Patent No. 2,709,007, issued May 24, 1955.

This invention relates to a railway car coupler and more particularly to improved knuckle opening mechanism for the coupler.

The various features and advantages of the invention will appear from the following description and claims taken in conjunction with the drawings, in which:

Fig. 1 is a longitudinal vertical sectional view of a coupler embodying the invention, showing the parts in locked position.

Fig. 2 is a transverse vertical sectional view taken along line 2—2 of Fig. 1.

Fig. 3 is a partial view in longitudinal vertical section showing the position of the various parts of the coupler just as upward movement of the lock begins upon actuation of the rotor lever.

Fig. 4 is a partial view in longitudinal vertical section showing the lock in lock-set position, with the other parts in reposed position.

Fig. 5 is a partial view in longitudinal vertical section showing the lock leg in engagement with the knuckle thrower during the process of opening the knuckle.

Fig. 6 is a partial view similar to Fig. 5 but showing the parts in full knuckle thrown position.

Figs. 7 and 8 are side and end view details of the rotor member.

Fig. 9 is a fragmentary sectional view taken along line 9—9 of Fig. 2.

Fig. 10 is a fragmentary sectional view, taken along line 10—10 of Fig. 5, showing the engagement between the lock leg incorporating my invention and the arm of the knuckle thrower.

Fig. 11 is a fragmentary sectional view, taken along line 11—11 of Fig. 1, showing the relationship between the lock leg and the coupler head when the lock is in normal locking position.

Referring to the drawings, the coupler comprises a head 10 and a knuckle 12 which is privotally connected to the head by means of the usual pivot pin 14. The knuckle comprises a tail portion 16 which, when the knuckle is in closed position, extends into a chamber 18 in the coupler head. Tail 16 may be formed with a vertical lock engaging face 20 and a laterally extending projection or shelf 22. The knuckle is held in closed position by a lock 24 which in locked position rests on a shelf 22 and engages face 20 on the knuckle tail and wall 26 on the coupler head. A chamber 28 is provided in the coupler head above the lock 24 for receiving the lock during lifting thereof to permit opening of the knuckle. The lock has a depending portion or leg 30 which extends into an opening 32 in the lower portion of the coupler head.

Within opening 32 and lying adjacent lock leg 30, is the lock lifter link 34, which is pivotally and slidably connected to the lock leg by means of a trunnion 36 which is received in an upwardly and rearwardly sloping

slot 38 in the lower portion of the leg. Lifter link 34 is formed with an anti-creep arm 40, which extends upwardly from trunnion 36 and underlies shelf 22. The upper end of arm 40 is preferably rounded and is adapted to engage the underside 41 of shelf 22 in the event that lock 24 creeps upwardly or is accidentally bounced upwardly to limit further movement thereof. The rearward portion of surface 41 is curved downwardly as at 41a to make the anti-creep more effective. Link 34 also has a downwardly extending arm 42 which is received in the bifurcated forwardly extending portion 44 of rotor lever 46 and is pivotally connected thereto by means of a pin 48. The rearward end 50 of lever 46 is pivotally connected to the underside of the coupler head by means of a rotor member 52 which is mounted in the spaced depending flanges 54 and 56 on the coupler head.

Rotor member 52, as may best be seen in Figs. 7 and 8, comprises a key portion 58 which is received in a corresponding opening in portion 50 of the rotor lever, and cylindrical bearing portions 60 and 62 which are adapted to be received in flanges 54 and 56, respectively. Bosses 64 and 66 are formed on the inner side of flanges 54 and 56 to provide increased bearing areas for cylindrical portions 60 and 62. Rotor member 52 is provided with a flange 68 which, when the coupler parts have been assembled, is disposed between flange 54 and a retaining flange 70, thereby preventing the rotor member from being displaced axially from its normal position. An eye portion 72 is provided at the end of the rotor member for receiving the hooked end of an uncoupling rod 74 (shown in dot-dash in Fig. 2).

The operation of the parts to effect intentional unlocking of the coupler will now be described. Starting with the coupler parts in normal locked position, as seen in Fig. 1, as rotor member 52 is rotated through actuation of the uncoupling rod, rotor lever 46 is caused to pivot in a clockwise direction. The initial pivotal movement of lever 46 moves the lower end of arm 42 forwardly and upwardly and simultaneously therewith moves trunnion 36 rearwardly and upwardly to the upper or rearward end of slot 38 in the lock leg, as seen in Fig. 3. This operation serves to move the upper arm 40 from beneath shelf 22 on the coupler tail to inactive position. The lock is now free to be moved to unlocked position and upon rotation of lever 46 from its position in Fig. 3, an upward and rearward force is directed by trunnion 36 against the lock leg. Since the lock leg is normally in engagement with rear wall 75 of opening 32 (Figs. 1 and 11), the initial movement of the lock is vertically upwards. However, after the lock is raised to the position wherein leg 30 is clear of wall 75, then the leg is moved both upwardly and rearwardly until shoulder 76 is above arm 78 of the knuckle thrower, after which, upon release of the uncoupling rod, the lock will be supported by shoulder 76 resting on arm 78. This is the lock-set position as shown in Fig. 4, in which the parts are shown at rest, with trunnion 36 occupying the lower end of slot 38. As the lock is actuated further from the lock-set position, the surface 80 of the lock leg now moves into contact with arm 78 of the knuckle thrower. In Fig. 5, surface 80 has just come into contact with arm 78. Rotation of lever 46 from this position continues to urge the lock upwardly until fulcrum lug 82 on the lock engages abutment 83 in the coupler head. Thereafter, the lock pivots about abutment 83 and lock leg 30 moves arm 78 rearwardly, thereby rotating the knuckle thrower and effecting pivoting of the knuckle toward open position through the action of arm 84 at the other end of the thrower against pad 85 on the knuckle. As rotation of lever 46 continues, the lock pivots a predetermined amount about abutment 83 until the top portion 86 of the lock moves into engagement with a secondary pivot

point 88 disposed above abutment 83, whereupon the lock pivots about the point 88 as the knuckle throwing operation progresses. A guide rib 89 serves to prevent the upper end of the lock from sliding forwardly during this operation. It will be apparent that the force now directed by the lock leg against arm 78 will be more nearly in a horizontal direction, as compared with its direction when the lock pivots about abutment 83, thereby exerting a greater effective force against the knuckle thrower during the final movement of the knuckle toward open position. As rotor lever 46 is rotated, the lock continues to pivot about portion 88 until the knuckle is fully thrown open. as seen in Fig. 6.

In accordance with my invention, the lower rearward side of lock leg 30 is relieved as at 96 (Figs. 10 and 11) thereby forming a projection 98 on the outer side of the lock leg on which is located the knuckle thrower engaging surface 80. This assures that during opening of the knuckle, as shown in Figs. 5 and 6, the force of the lock leg against arm 78 of the knuckle thrower will be directed thereto at a point a maximum distance from the pivotal axis of the thrower. Also, rear wall 75 of the coupler head is recessed as at 100 to receive projection 98 when the lock is in locked position, as seen in Figs. 1 and 11. In this position, a clearance exists between surface 80 of projection 98 and the opposing surface 102 on the coupler head, while surface 96 of the lock leg engages rear wall 75. Thus, in locked position of the coupler no wear takes place on surface 80.

Surface 80 is preferably rounded in a horizontal direction so as to provide improved surface contact with thrower arm 78. Also, the lower portion of surface 80, as at 80*a*, is formed so as to slope downwardly and forwardly when the lock is in locked position so that when this surface is in contact with the knuckle thrower near the completion of the knuckle throwing operation, it is disposed approximately in a vertical position. This, in conjunction with the pivoting of the lock about pivot point 88, results in the direction of a horizontal force to the knuckle thrower.

To assemble the coupler, the knuckle thrower is first applied to the coupler head through the front opening thereof. Next the rotor lever 46 to which the locklifter link 34 has previously been connected by pin 48, is applied to the head with the link hanging downwards. In this position of the rotor lever, rotor member 52 can be inserted through flanges 54, 56 and the key receiving opening in the rotor lever until flange 68 engages the outer side of depending flange 54 on the head. Thereafter, the lifter link is raised up through the lock receiving opening 32 in the head into a position in which arm 40 extends through the front opening in the head. During the latter operation the rotor lever is pivoted to a position in which flange 68 thereof is between retaining flange 70 and depending flange 54. The lock leg is next entered through the front of the coupler and trunnion 36 of the lifter link is hooked into slot 38 of the lock leg. Then the lock is lowered into the lock receiving opening 32, after which it is raised to the lock-set position, with shoulder 76 resting on the knuckle thrower arm 78. The assembly is completed with the application of knuckle 12 to the head.

Disassembly of the coupler is accomplished by performing each of the above steps in reverse order.

The terms and expressions which I have employed are used as terms of description and not of limitation, and I have no intention, in the use of such terms and expressions, of excluding any equivalents of the features shown and described or portions thereof, but recognize that various modifications are possible within the scope of the invention claimed.

What I claim is:

1. In a car coupler having a head, a pivoted knuckle, a knuckle thrower for opening said knuckle, a lock having a leg extending downwardly into an opening in said head, and means for actuating said lock to unlock the coupler, the rear wall of said opening having a forwardly extending abutment portion for engaging said lock leg when said lock is in locking position, said leg having a rearward projection spaced from said rear wall when said lock is in said last mentioned position, said projection being adapted for engagement with said thrower to actuate the latter during unlocking of the coupler.

2. In a car coupler having a head, a pivoted knuckle, a knuckle thrower for opening said knuckle, a lock having a leg extending downwardly into an opening in said head, and means for actuating said lock to unlock the coupler, the rear wall of said opening having a recess, said leg having a portion for engaging said rear wall when the knuckle is in locked position, said leg having a projection adjacent said portion extending into said recess, said projection being adapted for engagement with said knuckle thrower upon actuation of the latter during unlocking of said coupler.

3. In a car coupler having a head and a knuckle pivoted to said head, a knuckle thrower for opening said knuckle, a lock having a leg extending downwardly into an opening in said head, and means for actuating said lock to unlock the coupler, the rear wall of said opening having a rearwardly extending recess, said leg having a portion thereof in engagement with said rear wall and having a rearwardly extending projection adapted to be received within said recess, said projection having an end surface spaced from the opposing surface of said recess when the coupler is in locked position, said end surface being adapted for engagement with said thrower to actuate the latter during unlocking of said coupler.

4. A car coupler comprising a head, a pivoted knuckle, and a lock having a leg extending downwardly into an opening in said head, said head having a wall defining the rearward side of said opening, said wall being formed with a rearwardly extending recess, a projection on said leg adapted to extend into said recess, the rearward side of said projection being spaced from an opposing surface of said recess when said lock is in locking position, said wall having a portion adjacent said recess adapted for engagement with an opposing portion of said leg when said lock is in locking position.

5. In a car coupler of the knuckle type a head, said head having an opening in the bottom wall thereof, said opening having a rear wall formed with a vertically extending recess therein, said recess being adapted for receiving a portion of the leg of an associated lock when the lock is in locking position, said rear wall having a portion thereof adjacent said recess adapted for engagement with another portion of the lock leg when the lock is in locking position.

6. In a car coupler, a knuckle, a knuckle thrower, a lock, said lock comprising a depending leg adapted to extend downwardly into an opening in said coupler, said leg having a pair of surfaces on the rearward side thereof spaced apart longitudinally of the coupler, one of said surfaces being adapted for engagement with the rear wall of said opening and another of said surfaces being disposed in spaced relationship with said wall when said lock is in locking position, said last-mentioned surface being adapted for engagement with said knuckle thrower during unlocking of said coupler.

7. In a car coupler having a head, a pivotally mounted knuckle, a knuckle thrower for opening said knuckle, a lock, said lock having a leg portion extending downwardly into an opening in said head, said portion having a plurality of abutment surfaces on the rearward side thereof in longitudinally spaced relationship, said head having a wall defining the rearward side of said opening, said wall having longitudinally spaced surfaces opposing said surfaces on said portion, one of said surfaces on said portion engaging one of said surfaces of said wall when said lock is in locking position, another of said surfaces on said portion being disposed in spaced rela-

tionship to an opposing one of said surfaces of said wall when said lock is in locking position, said last-mentioned surface on said portion being adapted for engagement with said knuckle thrower during opening of said knuckle.

8. A lock for a car coupler, said lock comprising a depending leg portion adapted to extend downwardly into an opening in the coupler head, said leg portion having a projection on the rearward side thereof for engagement with a knuckle thrower, and an abutment portion on the rearward side of said leg portion, adjacent said projection and disposed forwardly of said projection, said abutment portion being adapted for engagement with the rear wall of a lock-receiving opening in the coupler when said lock is in locking position.

References Cited in the file of this patent

UNITED STATES PATENTS

1,639,300 Kinne ---------- Aug. 16, 1927

FOREIGN PATENTS

354,163 Great Britain ---------- Aug. 6, 1931