

July 28, 1953

W. J. METZGER

2,646,896

CAR COUPLER

Filed Jan. 13, 1951

3 Sheets-Sheet 1

Fig. 1

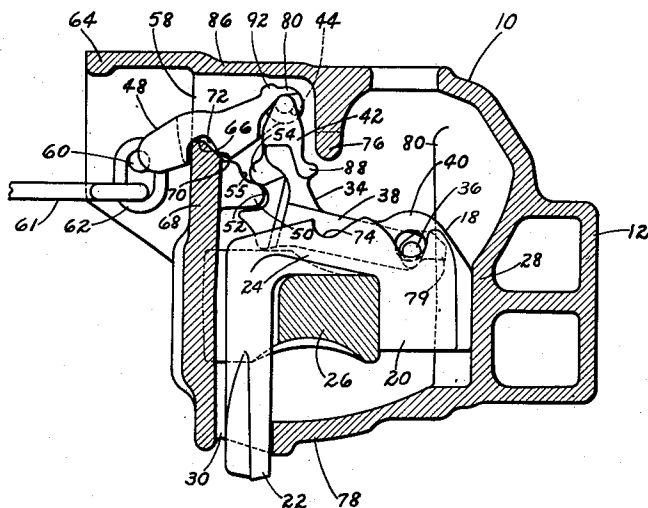
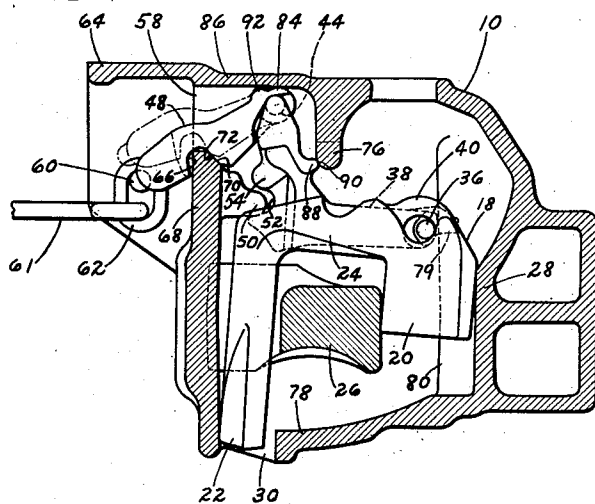


Fig. 2



INVENTOR.

WILLIAM J. METZGER

BY

Henry Kozak

ATTORNEY

July 28, 1953

W. J. METZGER

2,646,896

CAR COUPLER

Filed Jan. 13, 1951

3 Sheets-Sheet 2

Fig. 3

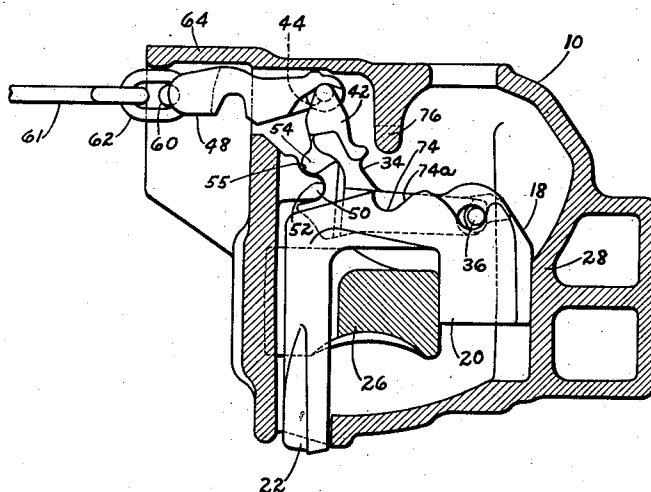


Fig. 4

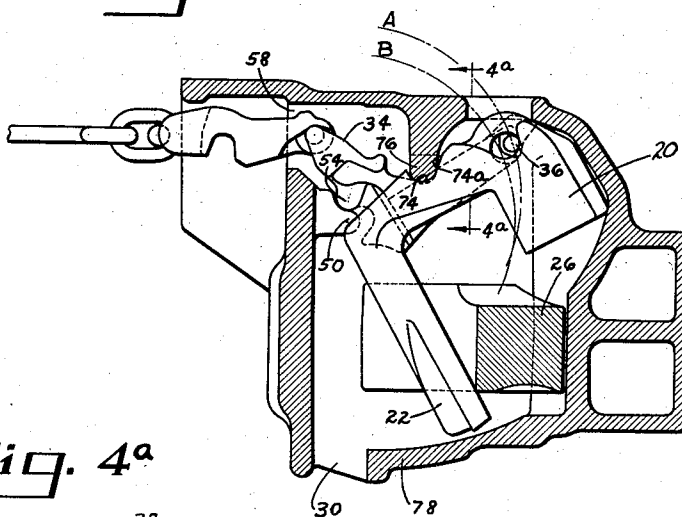
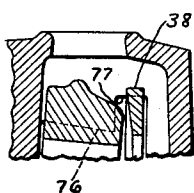


Fig. 4a



INVENTOR.

WILLIAM J. METZGER.

BY

Henry Kozak

ATTORNEY

July 28, 1953

W. J. METZGER
CAR COUPLER

2,646,896

Filed Jan. 13, 1951

3 Sheets-Sheet 3

Fig. 5

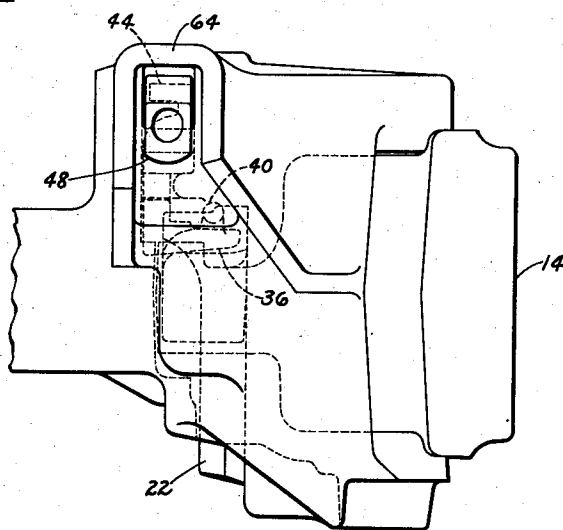
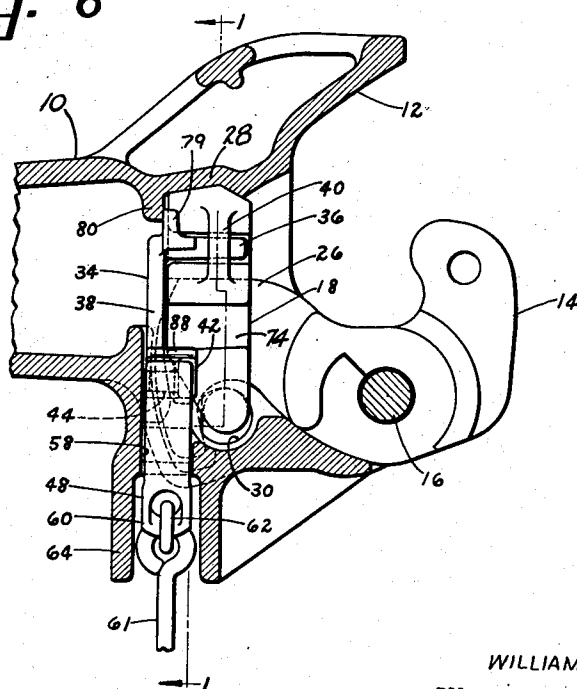


Fig. 6



INVENTOR.
WILLIAM J. METZGER
BY *Henry Kozak*
ATTORNEY

UNITED STATES PATENT OFFICE

2,646,896

CAR COUPLER

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

Application January 13, 1951, Serial No. 205,875

8 Claims. (Cl. 213—121)

1

My invention relates to car couplers and more particularly to improvements in coupler operating mechanisms of the type which permit the coupler to be operated by a direct side pull.

My invention provides various improvements in the anti-creep means and the knuckle operating means disclosed in the Letters Patent to William Blackmore, No. 1,201,679, dated October 17, 1916.

It has been observed in the past that the performance of coupler operating mechanism of the type described in the above Blackmore patent has not been entirely satisfactory. This type of mechanism does not provide sufficient anti-creep protection for the lock to prevent the same from creeping or accidentally bouncing upwards in service to a position in which the knuckle is free to swing open, resulting in train partings. Also, with this coupler operating mechanism, it is virtually impossible by manipulation of the uncoupling rod handle to swing the knuckle to fully opened position because of certain structural features which tend to retard rather than facilitate operational movement of the various parts.

Accordingly, an object of my invention is to provide positive anti-creep means for maintaining the coupler locked at all times except when manual unlocking of the coupler knuckle by means of the uncoupling rod is desired.

Another object of my invention is to provide a novel coupler operating mechanism such as will effect full opening of the knuckle and will facilitate operational movement of the various parts.

Another object of my invention is to provide means for preventing accidental disassociation of the operative parts in service.

These and other objects and advantages of my invention will be apparent from the following description taken in conjunction with the drawings, in which:

Fig. 1 is a transverse vertical sectional view of a coupler, embodying my invention, taken along line I—I of Fig. 6, the parts being shown in locked position.

Fig. 2 is a view similar to Fig. 1, but with the anti-creep means in engagement to preclude upward movement of the lock to a position in which the knuckle is unlocked.

Fig. 3 is a view similar to Fig. 1, but showing the lock in partly raised position as occurs upon a predetermined amount of actuation of the uncoupling mechanism.

Fig. 4 is a view similar to Fig. 1 but with the parts actuated by the uncoupling mechanism to

2

a position in which the knuckle is swung fully open.

Fig. 4a is a fragmentary sectional view taken along line 4a—4a of Fig. 4.

Fig. 5 is an elevational view of the knuckle side of the coupler showing the coupler in locked position.

Fig. 6 is a plan view in section of the coupler, the parts being shown in locked position, as in Fig. 1.

Referring to the drawings the coupler comprises a chambered head 10 having the usual guard arm 12. The knuckle is pivotally connected to the head by means of a vertical pin 16. The knuckle is locked in closed position by a lock 18 which also serves to swing open the knuckle during actuation of the uncoupling mechanism.

Lock 18 is U-shaped and is formed with a locking portion 20, a depending leg portion 22 and a horizontal connecting portion 24. Locking portion 20 is adapted to be received between tail 26 of the knuckle and wall 28 of the coupler head to lock the knuckle in closed position. Leg portion 22 extends through an opening 30 in the bottom of the coupler head when the lock is in locking position. The lock is supported on the knuckle tail 26 by means of connecting portion 24, as in Fig. 1. It will thus be seen that lock 18 straddles the knuckle tail when the knuckle is closed and the lock is in locking position.

The lock is directly actuated by means of a lock lifting lever 34 which is pivotally connected to the lock at the upper end of portion 20 by a horizontal finger 36 on horizontal arm 38 of the lever, which extends through an eye portion 40 on the lock. The upper end of vertical arm 42 on lever 34 is provided with a horizontally extending pivot lug 44 which is received in an opening in the link element 48 to pivotally connect these parts.

Lever 34 is adapted for pivotal movement in a vertical direction with respect to the coupler head by means of a double fulcrum and socket engagement. In the operation of the coupler, so as to swing the knuckle to open position, initial pivotal movement of lever 34 takes place about fulcrum bearing or projection 50 in the coupler head. Projection 50 is received in socket 52 in lever 34 during the initial pivotal movement of the lever. Subsequently, pivotal movement of lever 34 transfers from projection 50 on the head to fulcrum bearing or projection 54 on the lever to assure full opening of the knuckle, as will be later explained. Projection 54 is adapted to be received in socket

55 which is disposed directly above projection 50.

Link element 48 extends through an opening 58 in the side of coupler head and is provided at its outer end with an eye 60 to which the uncoupling mechanism 61 is connected by means of a link 62. A shroud 64 is provided about opening 58 to protect element 48 from damage by external objects such as might accidentally fall or fly against the coupler in service.

The underside of link element 48 is notched as at 66 at a point intermediate its ends to receive the portion of side wall 68 of the coupler head located below opening 58. Notch 66 has a shoulder 72 which engages beveled surface 70 on wall 68 when the parts are in anticreep position. The functioning of the lock anti-creep means will be explained in a succeeding part of the description.

The operation of the coupler parts upon actuation of the uncoupling mechanism to effect opening of the knuckle is as follows: With the coupler parts as shown in Fig. 1, a lateral pull on the uncoupling mechanism 61 will swing link element 48 upwardly about pivot lug 44 to substantially a horizontal position, so that its anti-creep shoulder 72 will clear beveled surface 70 on the coupler head. A further pull on uncoupling member 61 will cause lever 34 to fulcrum about projection 50 which is received in socket 52 and thereby cause finger 36 to raise the lock, as shown in Fig. 3. As portion 20 of the lock is raised clear of the knuckle tail 26, socket 74 on central portion 24 is brought into engagement with the rounded under-surface of depending projection 76 in the coupler head. Also, lever 34 at this time begins to fulcrum about projection 54. A continuation of the pull on uncoupling member 61 causes the lock to fulcrum about projection 76 so that portion 20 of the lock is swung into the upper end of the coupler head while lock leg 22 is swung transversely against knuckle tail 26 causing the knuckle to swing open. This action continues until the knuckle is swung to completely open position, as shown in Fig. 4. Projection 76 is recessed as at 77 (Fig. 4a) to receive arm 38 of lever 34 at the completion of knuckle opening operation. When the uncoupling member is released the lock leg 22 drops onto the floor 78 of the coupler, thereby supporting the lock. Subsequently, as the knuckle is swung closed, tail 26 sweeps lock leg 22 to opening 30 and allows the lock to drop to its lowermost position as shown in Fig. 1.

A feature of the invention resides in the double fulcrum action provided for lever 34 by projections 50 and 54 on the coupler head and on the lever, respectively. This not only provides for free pivotal movement of lever 34 throughout its movement during intentional unlocking and opening of the knuckle but also assures that a more nearly vertical force is directed by finger 36 of the lever to eye 40 on the lock during the final stage of the knuckle opening operation. It will be observed that projection 54 is located substantially directly above projection 50 so that it will be apparent that when lever 34 pivots about projection 54, finger 36 will move in a more nearly vertical arc, indicated at "A" in Fig. 4, near the completion of the knuckle opening operation, as compared with arc "B" which is drawn about projection 50. This more nearly vertical travel of finger 36 along arc "A" assures that projection 76 will remain properly seated in socket 74 during fulcruming of the lock as the knuckle is swung to fully opened position. Thus the possibility of side surface 74a adjacent socket 74 being forced

into engagement with projection 76 and thereby causing the lock to fulcrum at a point on the side of projection 76 is avoided. Also it will be apparent that the moment arm of finger 36 as it travels in path "A" is greater with respect to socket 74 during the final portion of the knuckle opening operation than if it were to travel along path "B." Accordingly, not only a decreased pulling force on uncoupling mechanism 61 is required during the knuckle opening operation but the construction assures that the knuckle will be swung to fully opened position.

In order to preclude disengagement of finger 36 from eye 40 on the lock, the end of arm 38 of lever 34 is provided with an extension 79 which overlaps vertical rib 80 in the coupler head, thereby preventing rearward displacement of the end of arm 38, as best seen in Fig. 6.

In Fig. 2 is shown the functioning of the anti-creep means for preventing unlocking of knuckle 14. The lock 13 is shown in the highest position to which it may creep. In this position of the lock lever 34 and link 48 in conjunction with the coupler head provide positive means for precluding further upward creeping or movement of the lock. It will be noted that shoulder 72 on link 48 is in engagement with beveled surface 70 on the coupler head while the upper end 84 on the link engages the top wall 86 of the head. Also, a transversely extending lug 88 on lever 34 is in engagement with projection 76 as at 90. It will be apparent that this three-point engagement precludes any further raising of lever 34 or rotation thereof in a counterclockwise direction as would be necessary to permit further upward movement of the lock beyond the position shown in Fig. 2. Thus the lock is effectively maintained in locking position at all times and undesired opening of the knuckle is precluded.

During actuation of uncoupling mechanism 61 to unlock the coupler, lug 88 clears projection 76, as may be seen in Figs. 3 and 4, and in no way interferes with the unlocking operation.

The operation of the anti-creep means to limit upward movement of the lock during vertical bouncing of the coupler in service is similar to that during gradual upward creeping of the lock as described above, except that as the parts are thrown upward, element 48 may swing about pivot lug 44 until the projection 92 on the top side of the link engages top wall 86, thereby maintaining shoulder 72 in engagement with beveled surface 70, as shown in dot-dash in Fig. 2. It will be noted that with projection 92 in contact with wall 86 an upward force directed against link 48 by pivot lug 44 will tend to cause counterclockwise movement of the link about projection 92 and therefore urge shoulder 72 into tighter engagement with surface 70. Projection 92 in no way interferes with the operation of the coupler parts during actuation thereof by means of uncoupling mechanism 61.

It will thus be seen that my invention provides effective means for limiting upward creeping or movement of the lock, so that undesired unlocking of the knuckle is precluded.

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.

I claim:

1. In a car coupler having a chambered head, a

5

knuckle pivoted to said head, a lock for maintaining said knuckle in closed position, a lever connected to said lock for raising said lock out of locking position, and double fulcrum means for pivotally mounting said lever in said head, said means comprising a projection in said head about which said lever fulcrums during initial raising of said lock out of locking position, and a projection on said lever for engaging said head at a point directly above said projection on said head, said lever upon actuation thereof to raise said lock out of locking position being adapted to fulcrum about said projection on said lever after a predetermined amount of pivotal movement about said projection on said head.

2. In a car coupler having a chambered head, a knuckle pivoted to said head, a lock having a locking portion for maintaining said knuckle in locked position and a leg portion for engaging said knuckle to swing the latter open during unlocking operations, a lever connected to said lock for lifting said lock out of locking position and for fulcruming said lock in a vertical plane about a projection in said head to urge said leg against said knuckle to swing the latter to open position, link means for actuating said lever, and fulcrum means for pivotally mounting said lever in said head, said last named means comprising a projection on said head about which said lever fulcrums during initial lifting of said lock out of locking position, and a projection on said lever about which said lever fulcrums after a predetermined amount of pivotal movement about said projection on said head.

3. In a car coupler having a chambered head, a knuckle pivoted to said head, a lock for maintaining said knuckle in closed position, a pivotal lever for lifting said lock out of locking position, said head having a fulcrum bearing and a socket portion adjacent to and above said bearing, said lever comprising a socket portion for receiving said bearing on said head to enable pivotal movement of said lever during initial lifting of said lock out of locking position, said lever having a fulcrum bearing adapted to be received in said socket portion in said head whereby pivotal movement of said lever about said bearing on said head transfers to said bearing on said lever after said initial lifting of said lock.

4. In a car coupler having a chambered head, a knuckle pivoted to said head, a lock for maintaining said knuckle in closed position, a pivotal lever for lifting said lock out of locking position, said lever having a double fulcrum and socket engagement with said head, said lever comprising a horizontal arm and a vertical arm, a link member connected to said vertical arm for transmitting pulling forces thereto to effect pivotal movement of said lever, said lock having an eye portion at the upper end thereof, said horizontal arm having pivot means extending into said eye and adapted to lift said lock upon pivotal movement imparted to said lever by said link member, vertical rib means in said head adjacent the end of said horizontal arm, and an extension on said horizontal arm overlapping said rib means to preclude disengagement of said pivot means from said eye portion.

5. In a car coupler having a chambered head, a knuckle pivoted to said head, a lock for maintaining said knuckle in closed position, a pivotally mounted lever for lifting said lock out of locking position upon pivotal movement of said lever,

6

said lever having a horizontal arm and a vertical arm, said horizontal arm being connected to said lock, a link member connected to said vertical arm for pivoting said lever to effect lifting of said lock, and anti-creep means for precluding upward movement of said lock to a position in which said lock is out of locking position, said means comprising a depending projection in said head and a lug on said lever for engagement with said projection upon pivotal movement of said lever in response to a predetermined amount of upward movement of said lock, said engagement precluding further pivotal movement of said lever and thereby preventing further upward movement of said lock.

6. In a car coupler having a chambered head, a knuckle pivoted to said head, a lock for maintaining said knuckle in closed position, a pivotally mounted lever for lifting said lock out of locking position upon pivotal movement of said lever, a link member pivotally connected to one end of said lever for pivoting the latter to effect lifting of said lock, said link having a notched portion for engagement with a beveled surface on a side wall of said head to limit undesired pivotal movement of said lever when said knuckle is in closed position, said link having a projection on the top side thereof adapted for engagement with the top wall of said head, when said coupler is subjected to vertical shocks, to preclude disengagement of said notched portion from said beveled surface.

7. A lock lifting lever adapted to be mounted in a coupler head for pivotal movement in a vertical plane, said lever comprising an arm having on one side thereof a socket portion about which the lever is adapted to pivot during initial lifting of an associated lock, a fulcrum bearing above said socket portion about which the lever is adapted to pivot after a predetermined amount of pivotal movement about said socket portion, and a lug on said arm positioned on the side thereof opposite to the side on which said fulcrum bearing is disposed, said lug being adapted for engagement with a depending projection in the coupler head to limit undesired pivotal movement of said lever in response to upward creeping of the associated lock.

8. A lock lifting lever adapted to be mounted in a coupler head for pivotal movement in a vertical plane, said lever comprising a pair of arms, one of said arms having pivot means at the end thereof for connection to an associated lock, the other of said arms having a socket portion about which said lever is adapted to pivot during initial lifting of said lock, said other arm also having a fulcrum bearing above said socket portion about which said lever is adapted to pivot after a predetermined amount of pivotal movement about said socket portion, and stop means at the end of said first-named arm adapted for engagement with a portion of the coupler head to prevent disengagement of said pivot means from said lock.

WILLIAM J. METZGER.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
Re. 11,477	Tower	Mar. 5, 1895
507,511	Tower	Oct. 24, 1893
541,446	Tower	June 18, 1895
557,917	Tower	Apr. 7, 1896
1,201,679	Blackmore	Oct. 17, 1916
2,023,550	Richards	Dec. 10, 1935