

Dec. 2, 1930.

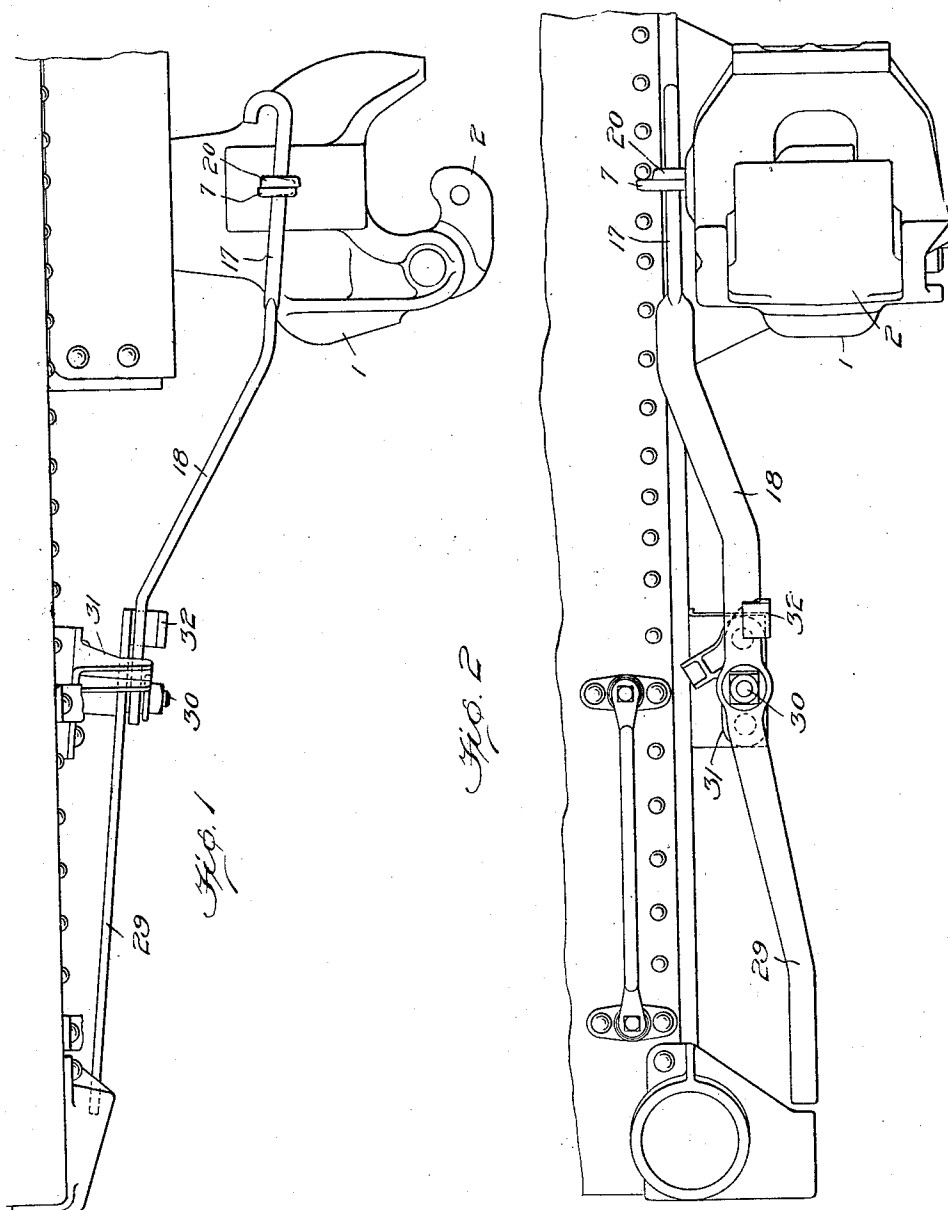
W. KELSO

1,783,655

CAR COUPLER MECHANISM

Filed Sept. 5, 1928

2 Sheets-Sheet 1



Inventor

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By

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Attorneys

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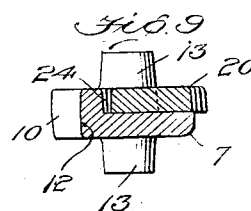
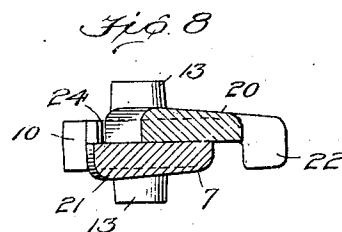
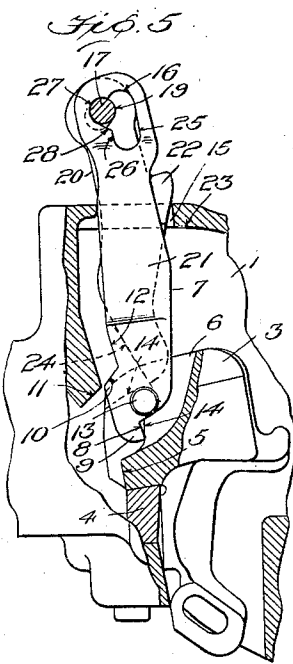
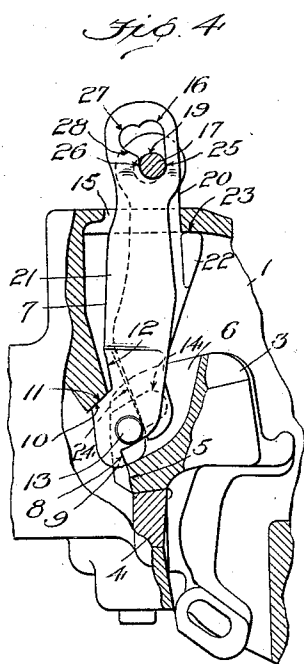
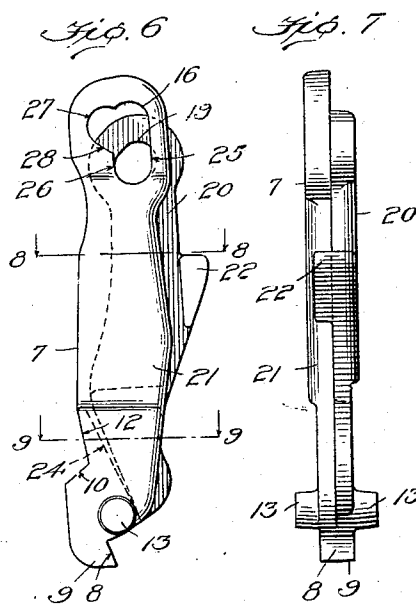
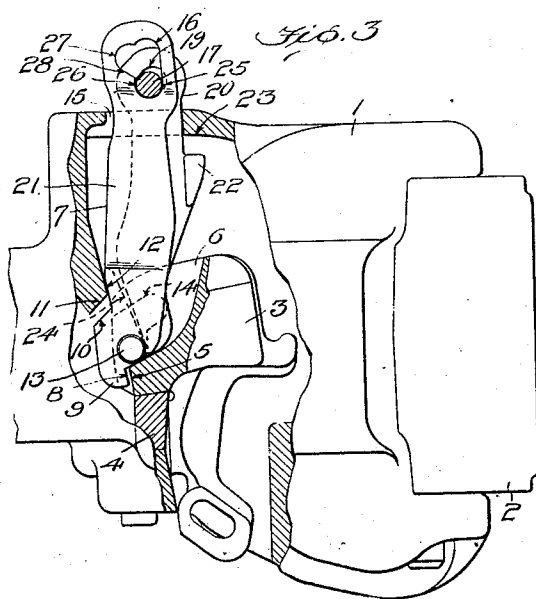
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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CAR-COUPLER MECHANISM

Application filed September 5, 1928. Serial No. 304,067.

My invention relates to car coupler mechanism and is particularly designed to insure that the lock by which outward rotation of the knuckle is normally restrained shall be reliably prevented from accidentally jarring to unlocked position in service, especially where the uncoupling device for causing the lock to assume unlocked position is of the well-known jointed lever or push-down type.

In the jointed lever type of uncoupling device referred to, which is largely used upon freight cars, the fulcrum or pivot pin is so positioned that the parts are not greatly out of balance about it and, therefore, the inner end of the uncoupling lever may be jolted or bounced upward as the car upon which it is mounted moves along the track. Where the speed is moderate and the track is in good condition, the upward movements imparted to the inner end of the uncoupling lever device are insufficient to release the means with which car couplers are commonly provided for preventing the knuckle locking block from accidentally moving to unlocked position. But under severe circumstances of service, such as bad condition of the track, high speed and the use at times of freight cars in express service, the severe jolting to which the car bodies are subjected occasionally results in an accidental upward movement of the inner end of the uncoupling lever of sufficient vigor and extent to release the locking block from the control of the means by which it is normally locked in locked position. If, as is frequently the case, there is little or no pull on the coupler knuckles at the time the locking block is accidentally released from the control of the lock-to-the-lock device, the locking block, not then being clamped between the tail of the knuckle and the side wall of the coupler head, is free to jump upward and assume lockset position, thus permitting the knuckle to rotate to open position and the train to part. It is the object of the present invention to provide a car coupler with means for preventing an uncoupling device of the jointed lever type from accidentally causing the means by which the coupler locking block is normally retained in locked position from being moved to un-

locked position as a result of shocks and jars incident to the motion of the train.

The primary feature of the invention, generally stated, consists in associating with a coupler lock and its lifter an uncoupling lever locking member which extends into the coupler head and is adapted to cooperate with the latter to prevent an accidental unlocking movement of the lever the lock lifter being designed to cooperate with the coupler head to lock the locking block in locked position and the uncoupling lever cooperating both with the lifter and with the lever locking member and being adapted to actuate them so as to effect an unlocking of the coupler knuckle.

A further feature of the invention consists in providing means for cooperating with the uncoupling lever to prevent the latter from shifting as the result of a sudden stopping or starting of the train or a severe application of brakes, so that release of the means by which the lever is prevented from freeing the coupler lock from the control of its lock-to-the-lock device is avoided.

Other features of the invention pertaining to advantageous combinations of parts and desirable details of construction will hereinafter appear and be pointed out in the claims.

In the drawings,—

Figure 1 is a plan view of a car coupler embodying the invention showing its relation to an uncoupling device of the jointed lever type, portions of the car upon which the coupler and its uncoupling device are mounted being also shown.

Figure 2 is a front elevational view of the construction shown in Figure 1.

Figure 3 is a view, partly in side elevation and partly in vertical section, of the car coupler and associated uncoupling device, the parts being in normal locked relation.

Figure 4 is a detail elevational view, partly in section, showing the relations assumed by the parts when the lock lifter has been partially raised by the upward movement of the inner end of the uncoupling lever while the locking block remains in normal locked position.

Figure 5 is a view corresponding to Figure

4 but showing the positions of the parts when the locking block has been released from the control of the means by which it is normally locked in locked position.

5 Figure 6 is a detail elevational view of the lock lifter and the means associated therewith for controlling upward movement of the inner end of the uncoupling lever device, the parts being in the relation illustrated in Figure 3.

10 Figure 7 is a front elevational view of the associated parts shown in Figure 6.

Figure 8 is a detail sectional view on the line 8—8, Figure 6.

15 Figure 9 is a detail sectional view on the line 9—9, Figure 6.

The coupler illustrated in the drawings for the purpose of describing the invention is of the well-known standard D-type, wherein 1 indicates the coupler head, 2 is the pivoted knuckle, 3 is the locking block for normally restraining uncoupling rotation of the knuckle, and 4 is the horizontally rotatable knuckle opener lever which is actuated by the lock to force the knuckle to open position. All of these parts may be of the well-known standard form but, if desired and as shown in the drawings, the usual standard locking block may be structurally modified to provide a bevelled face 5 upon the rear side of the lock at a point immediately below the recess 6 for receiving the lock lifter 7, the said bevelled face serving to cooperate with the forward undercut face 8 of a downwardly projecting lug at the lower end of the lifter, as fully described in my pending application for Letters Patent of the United States, Serial No. 282,446, filed June 2, 1928. It is preferred to provide the lock lifter with the undercut lug 9 at its lower end and to provide the locking block with the cooperating bevelled face 5, instead of following the usual practice in respect to the form of the lower end of the lock lifter and the form of the locking block, as such a construction has been found effective to prevent the locking block from accidentally moving to unlocked position under all conditions except where the uncoupling device provided for unlocking the coupler is of the jointed lever or push-down type, and then only under unusually severe joltings due to the passage of the train at high speed over track in bad condition.

55 The lifter 7, for moving the lock to unlocked position, is formed toward its lower end with an upwardly facing inclined shoulder 10 adapted to cooperate with the lower end of the usual lock-down lug 11 on the interior of the coupler head to prevent the lock 3 from accidentally moving to unlocked position. Above the shoulder 10 the lifter 7 is fashioned with a rear face 12 for engaging the forward face of the lug 11 to limit rearward movement of the lower end of the lock

lifter when the parts are in normal locked relation. The lower end of the lifter is formed with oppositely disposed trunnions 13 which operate in shouldered guideways 14 of the locking block in a well-known manner, these parts thereby being slidably and pivotally connected so as to permit the shoulder 10 of the lifter to be withdrawn from beneath the lockdown lug 11 of the coupler head and to enable the locking block 3 to perform the subsequent swinging or rotary movements required for causing the lock to assume lock-set position and for actuating the knuckle opener 4.

The lifter 7 extends upwardly through an opening 15 in the top wall of the coupler head, its upper end being apertured, as at 16, to receive the end portion 17 of the inner lever member 18 of the well-known uncoupling device of the push-down or jointed lever type. The lifter engaging portion 17 of the jointed uncoupling lever also extends through an eye or opening 19 of a member 20 which serves to prevent the inner portion 17 of the uncoupling lever member 18 from accidentally jumping upwardly to effect a movement of the lock lifter 7 which would result in releasing the locking block 3 from the control of the lock-to-the-lock means normally provided by the cooperation of the shoulder 10 of the lock lifter with the lock down lug 11 of the coupler head. This lever locking member 20 extends downwardly through the opening 15 of the coupler head and lies closely adjacent and in overlapping relation to the lock lifter 7, the upper portion 21 of the latter and the lever locking member 20 each preferably being of such thickness that when in assembled relation side by side both may extend through the standard size and shape of lock lifter opening 15 in the top wall of the coupler head 1. At a point intermediate of its ends and preferably about one-third of the way down from its upper end, the lever locking member is provided on its forward face with an extension or shoulder 22 which, when the parts are in locked relation, stands under the portion 23 of the top wall of the coupler head immediately forward of the opening 15 through which the member 20 and the lock lifter 7 project, the shoulder 22 being spaced downwardly a short distance below the adjacent overlying top wall of the coupler head. The forward extension or shoulder 22 projects laterally so as to lap the forward surface of the lock lifter 7 when the parts are assembled in the coupler. By this means the member 20 is assured of long life in service for the upper surface of the lug or shoulder 22, which comes into contact with the overlying wall of the coupler head in performing the function of locking down the inner end 17 of the uncoupling lever device, is thus made to have a relatively large area for re-

sisting wear. For a similar reason, namely, to afford ample area for resisting wear, the lock-to-the-lock shoulder 10 at the lower end of the lock lifter 7 is preferably the same width as the combined thickness of the overlapped upper portions of the members 7 and 20.

The change in thickness of the lock lifter 7 provides an upwardly facing shoulder 24 on the lifter member 7 which is adapted to cooperate with the lower end of the lever locking member 20. As will be appreciated the forward extension or shoulder 22, being in advance of the portion 17 of the uncoupling lever, tends to cause a rearward rotation of the lever locking member 20 around the lever 17 as a pivot or fulcrum when said extension comes into contact with the under surface of the top wall of the coupler head. This tendency of the lower end of the lever locking member 20 to rotate with respect to the lock lifter 7 under the circumstances stated is resisted by the seating of the member 20 against the shoulder 24 of the lock lifter, as will be readily perceived from inspection of Figure 4. The lower end of the lever locking member 20 is supported laterally by extending into the lifter receiving slot 6 of the locking block between the lock lifter 7 and the adjacent wall of the lock 3, the extent to which the member 20 projects into the slot 6 being sufficient to insure that its lower end shall remain in said slot when the lifter 7 is raised to its highest position with respect to the locking block 3. By this means any danger of the lower end of the lever locking member 20 escaping from the lifter slot and riding the top of the locking block 3 so as to prevent the parts dropping to locked position in the act of coupling is eliminated.

The eye or opening 16 at the upper end of the lock lifter for receiving the portion 17 of the inner uncoupling lever member 18 is elongated vertically to form a lost motion connection permitting the part 17 to move upward a short distance without carrying the lock lifter with it. The lower portion of the opening is constricted to provide substantially vertical front and rear shoulders 25 and 26 respectively which are adapted to cooperate with the portion 17 of the uncoupling lever mechanism. These shoulders normally stand on opposite sides of the inner end 17 of the uncoupling lever when the parts are in locked relation. They thereby prevent the inner end of the uncoupling lever from being thrown into a position which would release the lever locking member 20 as a result of sudden stopping or starting of the train or of severe application of brakes to reduce speed. The upper portion of the lever receiving opening 16 in the lock lifter is widened as at 27 so as to extend to the rear of the lower constricted portion of said opening, the lower rear

wall 28 of the wider part of the opening being inclined to provide a slope down which the inner end 17 of the uncoupling lever may slide when the latter is free to descend after having been actuated by the trainman. The opening 19 in the lever locking member 20 may be slightly elongated and inclined to the vertical so as to permit the weight of the inner portion 17 of the uncoupling lever to force the forward extension or locking shoulder 22 well under the overlying portion 23 of the top wall of the coupler head when the parts are in normal locked relation. While, in the particular embodiment of the invention illustrated the widened portion 27 of the lever receiving opening 16 extends toward the rear of the lock lifter 7, it is to be understood that this widening of the opening 16 is to be in a direction away from the locking extension or shoulder 22, on whatever part said shoulder may be formed. It is also to be noted that the widened opening is to be formed in the member which does not have the locking shoulder 22 thereon.

The uncoupling device for unlocking the coupler locking mechanism is of the form commonly in use in which a downward push on the outer end of an outer lever member 29 actuates an inner lever member 18 to cause the portion 17 of the latter which engages the coupler locking mechanism to move upwardly. These two lever members, 29 and 18, are pivotally mounted at 30 on a bracket 31 attached to the car body, the inner end 32 of the outer lever member extending under the inner lever member 18 so as to be able to impart an upward or uncoupling rotation to the latter.

The operation of unlocking the coupler to permit the knuckle to be opened is effected by the uncoupling lever mechanism in the usual way except that the operator should move the outer end of the handle or lever member 29 forwardly as it is forced downward, this forward movement, which is permitted by the normal looseness of the uncoupling lever members on their pivot, being for the purpose of causing the inner end portion 17 of the lever member 18 to move to the extreme upper and rearward end of the widened part 27 of the opening 16 in the lock lifter 7. The movement of the portion 17 of the inner lever member upwardly and rearwardly in the opening 16 of the lock lifter shifts the lever locking member 20 rearwardly a sufficient distance to withdraw it from beneath the overlying portion 23 of the top wall of the coupler head and bring it into register with the slot 15 in the upper wall of the head. The lock lifter 7 and the lever locking member 20 are then free to be raised either to cause the locking block 3 to assume lockset position or to impart to it the extended unlocking movement necessary to actuate the knuckle opener

lever 4. The unlocking movement of the locking block ensues in the usual manner after the preliminary movement of the lock lifter 7 which withdraws its locking shoulder 10 from beneath the lockdown lug 11 on the interior of the coupler head.

In assembling the mechanism, the lock lifter 7 is inserted through the throat of the coupler head 1 and the locking block, knuckle opener and knuckle are assembled in the usual way. The locking block 3 is then raised to lockset position whereupon the lever locking member 20 can be inserted from above through the opening or slot 15 in the top wall of the coupler head. The portion 17 of the inner lever member of the uncoupling device may then be passed through the openings 16 and 19 respectively formed in the lock lifter 7 and the lever locking member 20, and the uncoupling device may thereafter be secured in place upon the bracket 31 carried by the car body.

I claim:

1. In car coupler mechanism, the combination of a coupler head, a rotatable knuckle, a lock for the knuckle, a lock lifter member movably connected to said lock and extending upwardly therefrom through the coupler head, an uncoupling lever device having an upwardly movable inner end portion adapted to actuate said lifter member to cause the latter to move said lock to unlocked position, and means extending through the top wall of the coupler head and adapted to cooperate with said head to prevent accidental uncoupling movement of the said end portion of the uncoupling lever device.

2. In car coupler mechanism, the combination of a coupler head, a rotatable knuckle, a lock for the knuckle, an uncoupling lever device having an upwardly movable inner end portion, and a plurality of relatively movable members movably connected to said end portion and extending downwardly therefrom into the coupler head, one of said members being provided with a shoulder for cooperating with the coupler head to prevent accidental uncoupling movement of said end portion of the uncoupling lever device and the other of said members being formed with an opening for receiving said end portion and permitting the latter to move in a direction opposite to the direction in which said shoulder extends, and one of said members being movably connected to the lock and adapted to actuate the latter and being provided with means for cooperating with said head to lock the lock in locked position.

3. In car coupler mechanism, the combination of a coupler head, a rotatable knuckle, a lock for the knuckle, a jointed uncoupling lever device having an upwardly movable inner end portion, and a plurality of relatively movable members movably connected to said end portion and extending therefrom

downwardly into the coupler head, one of said members being provided with a shoulder for cooperating with the coupler head to prevent accidental uncoupling movement of the said end portion of the uncoupling lever device and the other of said members being formed with an opening to receive said end portion, said opening being constricted at its lower end to provide shoulders normally preventing movement of said end portion longitudinally of the coupler and being widened at its upper end to permit movement of said end portion longitudinally of the coupler after said end portion has been moved vertically upward, and one of said members being movably connected to said lock for actuating the latter and being adapted to cooperate with the coupler head to lock said lock in locked position.

4. In car coupler mechanism, the combination of a coupler head, a rotatable knuckle, a lock for the knuckle, a lock lifter movably connected to said lock and extending therefrom upwardly through the coupler head, said lifter being adapted to cooperate with the coupler head to lock the lock in locked position and having at its upper end an opening for receiving an upwardly movable portion of an uncoupling lever device, an uncoupling lever device having an upwardly movable inner end portion extending into said opening of the lifter, and a member movably connected to said end portion and extending downwardly therefrom into the coupler head for preventing accidental uncoupling movement of said end portion, said last named member being movable with respect to the lock lifter and being formed with a shoulder normally extending under the top wall of the coupler head and in spaced relation thereto, and said uncoupling lever device being adapted to actuate said shouldered member to withdraw said shoulder from beneath the top wall of the coupler head and subsequently to actuate said lifter to cause the lock to assume unlocked position.

5. In car coupler mechanism, the combination of a coupler head, a rotatable knuckle, a lock for the knuckle, a lock lifter member movably connected to said lock and extending upwardly therefrom through the coupler head, an uncoupling lever device having an upwardly movable inner end portion adapted to actuate said lifter to cause the latter to move said lock to unlocked position, and a member movably connected to said end portion and extending downwardly therefrom through the top wall of the coupler head and provided with a shoulder normally extending under said wall and adapted to cooperate with the latter to prevent accidental uncoupling movement of the said end portion of the uncoupling lever device, said lock lifter member and said lever locking member being in overlapped relation, said shoulder over-

lapping said lifter transversely, and said lifter being provided at its lower end with a shoulder for cooperating with the coupler head to prevent said lock from accidentally moving to unlocked position.

6. In car coupler mechanism, the combination of a coupler head, a rotatable knuckle, a lock for the knuckle, a lock lifter movably connected to said lock and extending upwardly therefrom through the coupler head, an uncoupling lever device having an upwardly movable inner end portion adapted to actuate said lifter member to effect an unlocking movement of said lock, and a lever locking member for preventing accidental uncoupling movement of the said end portion of the uncoupling lever device, said lever locking member being movably connected to said end portion and having a shoulder normally extending under the top wall of the coupler head, and said lifter being formed with a shoulder for cooperating with said lever locking member to prevent the latter from rotating upon said inner end portion when said shoulder upon the lever locking member is in engagement with the top wall of the coupler head.

7. In car coupler mechanism, the combination of a coupler head, a rotatable knuckle, a lock for the knuckle, an uncoupling lever device having an upwardly movable inner end portion, and a plurality of relatively movable members movably connected to said end portion and extending therefrom downwardly into the coupler head, one of said members being formed with a shoulder normally extending along the top wall of the coupler head to prevent accidental uncoupling movement of the said end portion of the uncoupling lever device, and the other of said members being adapted to cooperate with the coupler head to prevent said shoulder from being withdrawn from beneath the top wall of the coupler head until after said end portion of the lever device has executed an upward movement, and one of said members being movably connected to the lock and adapted to actuate the latter.

In testimony whereof I affix my signature.

WILLIAM KELSO.