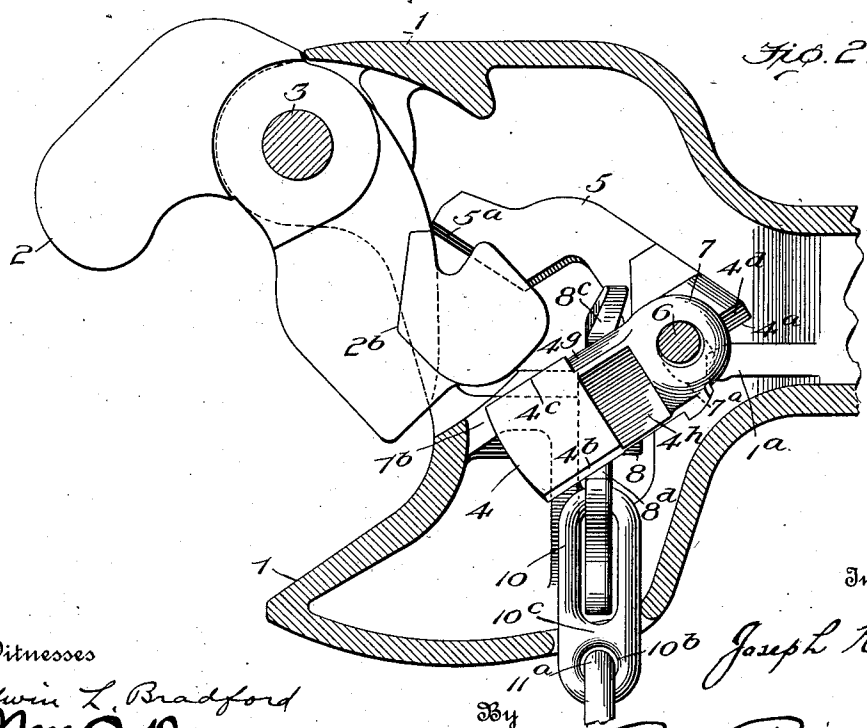
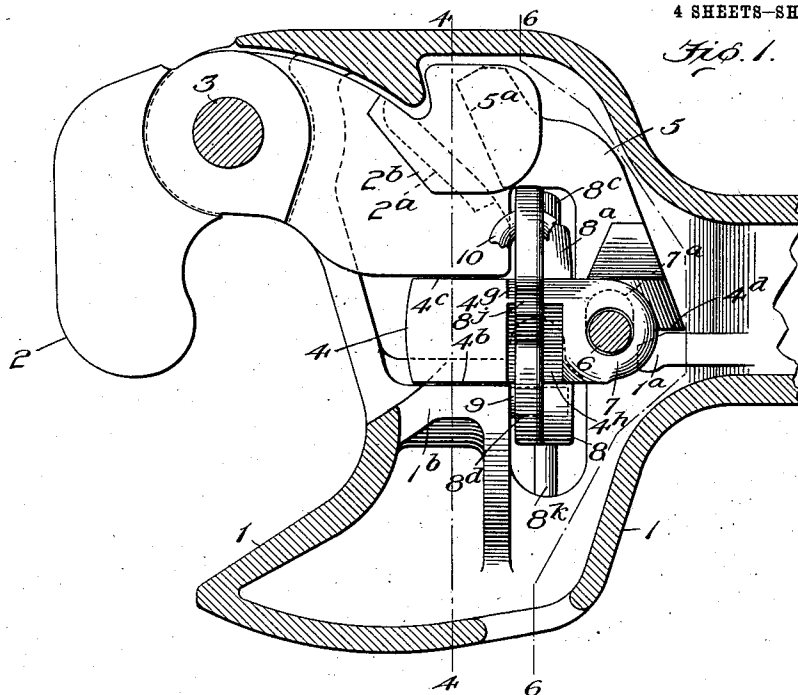


J. KELSO.
CAR COUPLING.
APPLICATION FILED APR. 14, 1911.

1,021,465.

Patented Mar. 26, 1912.

4 SHEETS-SHEET 1.



Witnesses
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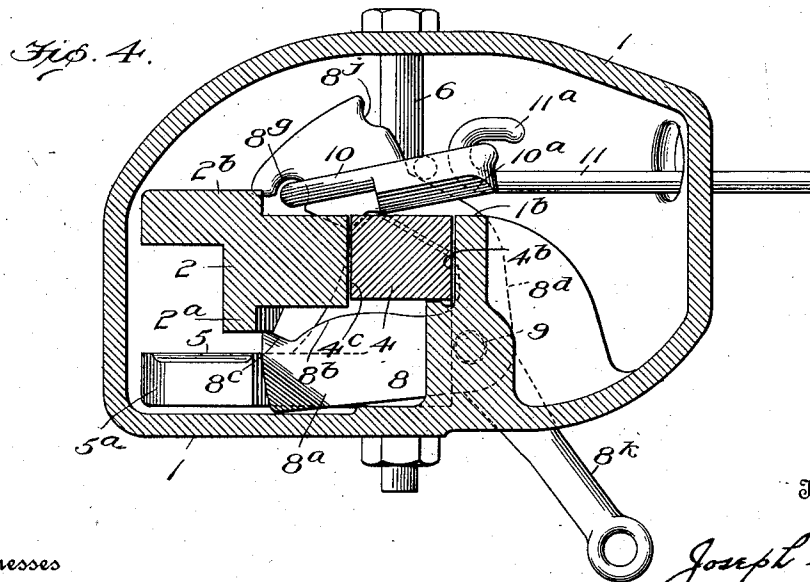
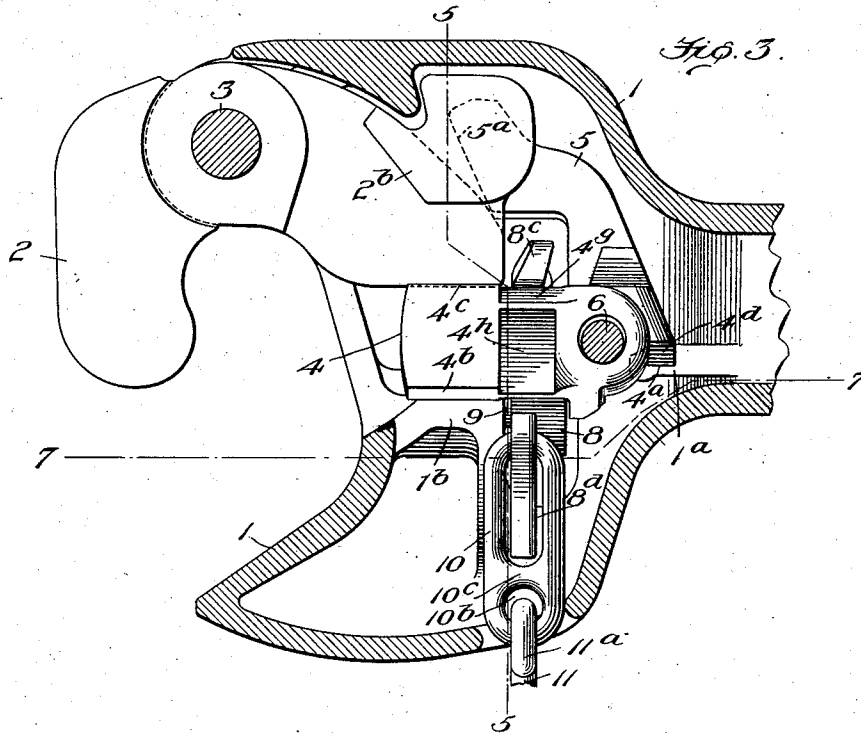
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

Fig. 5.

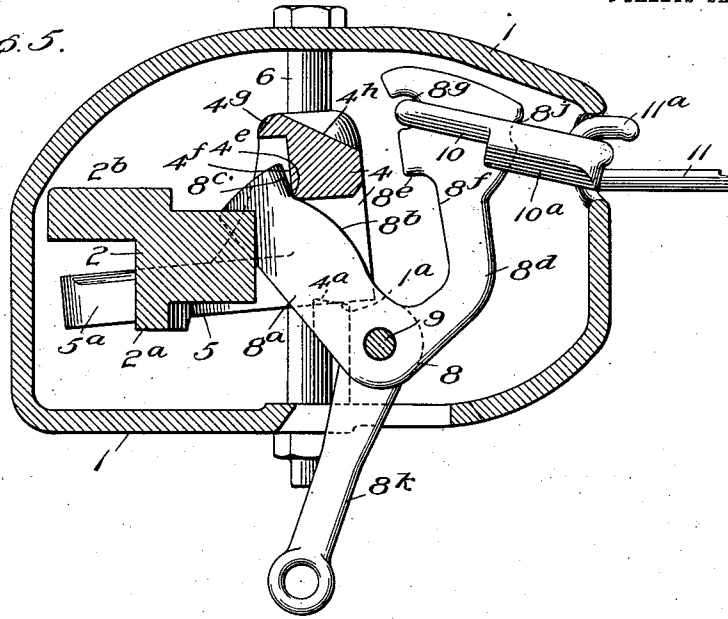
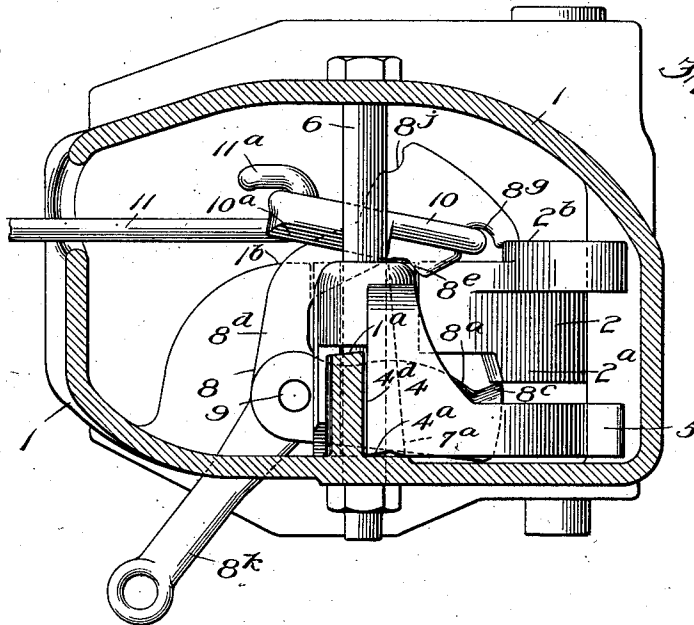


Fig. 6.



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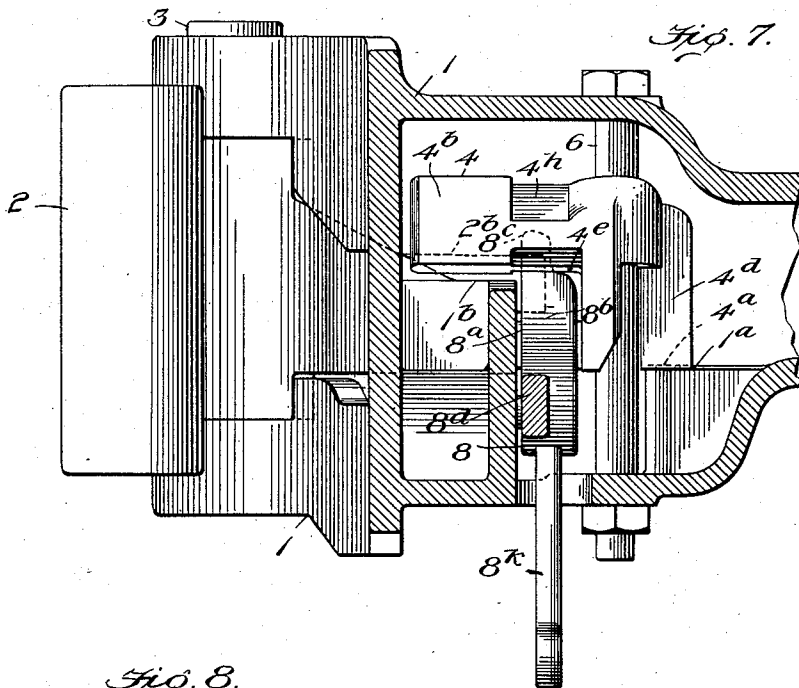
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4 SHEETS—SHEET 4.



UNITED STATES PATENT OFFICE.

JOSEPH KELSO, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO McCONWAY & TORLEY COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

CAR-COUPLING.

1,021,465.

Specification of Letters Patent.

Patented Mar. 26, 1912.

Application filed April 14, 1911. Serial No. 621,069.

To all whom it may concern:

Be it known that I, JOSEPH KELSO, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Car-Couplers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the construction of automatic car couplers of the vertical plane type and has for its object to provide strong, durable, easily operated and efficient means for locking and opening the knuckle, for maintaining the lock in a so-called lock-set position and for preventing the lock from accidentally moving to an unlocked position when the coupler is in service.

To this end the principal feature of my invention, generally stated, consists in mounting within the coupler head a knuckle locking member which may be moved vertically to an unlocked position, tipped so as to assume a position above and in engagement with a supporting seat whereby it is maintained in lockset or unlocked position, and rotated horizontally to throw the knuckle to open position, the lock being actuated by a vertically extending pivoted member which is movable transversely of the coupler head and which, when the parts are in normal or locked position, extends across the path of movement of the lock so as to lock the latter against accidentally assuming an unlocked position.

There are other, minor, features of invention residing in particular combinations of parts and special forms of construction, all as will hereinafter appear.

In the drawings chosen for the purpose of illustrating the invention, the scope whereof is pointed out in the claims, Figure 1 is a view of a coupler embodying my invention, the knuckle, lock, and lock-actuating mechanism being shown in plan in the position such parts occupy when the coupler is locked and the upper portion of the coupler head being broken away; Fig. 2 is a view similar to Fig. 1, but illustrating the relative positions of the parts when the lock is caused to perform a knuckle opening op-

eration to rotate the knuckle to open position; Fig. 3 is a view similar to Figs. 1 and 2 but showing the positions the parts assume when the lock is supported in lockset position to permit the knuckle to be subsequently rotated to an unlocked position; Fig. 4 is a vertical section taken on the line 4—4, Fig. 1, the parts being in locked position; Fig. 5 is a vertical section taken on the line 5—5, Fig. 3, the parts being shown in lockset position; Fig. 6 is a vertical section taken on the line 6—6, Fig. 1, the parts being shown in normal or locked position; Fig. 7 is a vertical section taken on the line 7—7, Fig. 3, the knuckle being closed and the lock being in lockset position; Fig. 8 is a detail perspective view of the combined lock and knuckle-opening member, and Fig. 9 is a detail perspective view of the lock actuating member.

Like symbols refer to like parts wherever they occur.

I will now proceed to describe my invention more fully, so that others skilled in the art to which it appertains may apply the same.

In the drawings, 1 is a coupler head, 2 the knuckle and 3 the knuckle pin by which the knuckle is pivotally mounted upon the coupler head in the usual manner. Housed within the coupler head and mounted thereon in such manner as to be capable of moving vertically upward and then rotating horizontally is a knuckle locking member 4 which is preferably fashioned with an integrally attached horizontally extending knuckle opening arm or knuckle opener 5. For the purpose of so mounting the combined lock and knuckle opener member as to permit it to be capable not only of a vertical rectilinear movement but also of a horizontal rotation, the coupler head 1 is preferably provided with a centrally located vertically extending shaft, axle or pin 6 which, as shown, may conveniently be a bolt that extends entirely through the coupler from the upper to the lower side thereof, the locking member 4 being formed at its inner end with a perforated lug 7 through which the shaft 6 extends. The shaft receiving aperture in the lug 7 is, generally speaking, cylindrical in form, its lower end, however, being somewhat elongated, as indicated at 7^a in order

to permit the lock to tilt laterally after it has moved upwardly upon the shaft sufficiently far to unlock the knuckle 2. This tilting of the combined lock and knuckle opener member upon the shaft causes the inclined lockset seat 4^a of the lock to move over the correspondingly inclined lockset seat 1^a with which the coupler head 1 is provided, so that if the knuckle 2 is not free to rotate outwardly after the lock 4 has been elevated sufficiently to permit it to do so the lug tilts upon the shaft 6 and causes the lockset seat 4^a of the lock to move over the lockset seat 1^a of the coupler head, whereupon, when the force tending to lift the lock vertically is withdrawn the said lockset seats come into engagement and the lock is maintained in an unlocked position which permits the knuckle 2 to be subsequently rotated outwardly to its open or unlocked position.

In order to prevent the lock 4 from rotating until after the knuckle 2 has been unlocked, the knuckle locking member is preferably provided near its outer end with a vertically extending guide face 4^b which is parallel to the knuckle engaging face 4^c of the lock; and in order to prevent the lock from binding upon the shaft or axle 6 as it moves upwardly thereon, the said lock 4 is also preferably provided with a vertically extending guide face 4^d that projects rearwardly from the lug 7 of the lock. These guide faces by abutting against corresponding vertically extending walls of the guide faces upon the interior of the coupler head serve to support the combined lock and knuckle opener member against the transverse pull of the pivoted lock operating member 8, as will be readily understood.

The knuckle opener member or arm 5, which is preferably integrally united to the lock 4, extends transversely of the coupler head, its outer end 5^a being adapted to engage the rear side of the knuckle tail and force the knuckle to rotate about its pivot pin 3 when the locking member 4 is caused to rotate upon its shaft or pivot 6. As shown, the lower face of the knuckle opener 5 preferably conforms to the inner lower face of the coupler head 1, thereby affording an extended bearing area for supporting the lock.

The lock operating member 8 by which the combined lock and knuckle opener member is raised and rotated is preferably fashioned as a bell crank lever that is pivotally mounted upon the coupler head by means of a pivot pin 9, the plane of rotation of the lock operating member being at an angle to that of the lock and being preferably vertical and extending transversely of the coupler head. The lower arm 8^a of the bell crank lever extends under the lock 4 forwardly of the pivot pin opening therein, its upper face being so curved or rounded vertically as at

8^b, to form a cam which engages and rides over the rounded portion 4^e of the lock as the latter rises vertically on the vertically extending shaft 6, and its outer end being formed with a toe or projection 8^c which, at the end of the upward vertical movement of the combined lock and knuckle opener member, engages the bearing face 4^f of the latter and causes the lock 4 and knuckle opener 5 either to rotate about the shaft 6 if free to do so, or, if the knuckle is restrained from outward rotation by reason of being in engagement with the coupler on an adjacent car, to cause the lock to be positively tilted upon the shaft or axle 6 into a lockset position, as heretofore described. While the shape of the combined lockset and knuckle opener member is such that it has a natural bias to gravitate into lockset position when sufficiently elevated, the positive tilting of the lock to lockset position is very advantageous.

The upper arm 8^d of the bell crank lever 8 extends above and preferably entirely across the upper face of the lock 4 to the rear of the tail of the knuckle 2, it being, as shown, preferably formed as a hook-like member having an inclined face 8^e that is adapted to normally extend across the path of vertical movement of the lock the latter being provided with a correspondingly inclined face 4^g that is adapted, when the lock accidentally moves toward an unlocked position, to engage and be arrested by the inclined face 8^e of the lock operating member 8, which thereby acts as a supplemental lock or so-called lock-to-the-lock to prevent the combined lockset and knuckle opener from accidentally assuming a position permitting the knuckle to rotate outwardly. In order that the hook-like arm 8^d of the lock operating member may the more certainly act as a lock-to-the-lock, it is preferred to incline its under face as at 8^f to conform to the correspondingly inclined upper face 4^h of the lock, the result being that when the lock 4 accidentally attempts to move upwardly these inclined faces cause the mating inclined faces 4^g and 4^e, heretofore mentioned, to more firmly engage each other.

The lock operating bell crank lever 8 may be actuated by an uncoupling rod or member which extends across the end of the car, and, as may be preferred, either enters the side of the coupler or extends under it. In the structure shown in the drawings provision is made for rotating the lock operating member 8 in both of these manners. As a simple means for permitting the lock operating member 8 to be actuated by an uncoupling member extending through an aperture in the side of the coupler, the upper end of the arm 8^d of the bell-crank lever is preferably formed with a recess 8^g which receives a link 10 through which the upper

end of the bell crank lever extends. Upon its under side this link member is provided with flanges 10^a which project downwardly on opposite sides of the member 8, thus preventing the link from twisting unduly when the coupler is in service. For the purpose of connecting the link 10 with the uncoupling member 11 the upper end of the link is preferably formed with an independent eye or opening 10^b which receives the hook 11^a with which the uncoupling device may be conveniently provided. By thus forming the link member 10 with independent openings for the uncoupling device 11 and lock operating member 8, the opening through which the latter extends may be made somewhat shorter than would otherwise be the case and, moreover, the bar or partition 10^c which separates the two openings in the link may be utilized to prevent the link from becoming disassociated from the bell crank lever, the upper arm 8^d of the latter being for this purpose provided with a seat or recess 8ⁱ into which the bar 10^c enters when the link 10 accidentally moves upwardly and inwardly.

When it is desired to be able to unlock the coupler by means of an uncoupling device or release rigging extending under the coupler head, the lock operating member 8 may be provided with an operating arm 8^k which projects downwardly through a suitable transverse opening in the lower wall of the coupler head. For convenience of manufacture, as well as to be able to dispense with the operating arm 8^k if it is not desired to use it, the upper end of such operating arm is preferably rectangular in cross section and fits into a correspondingly formed socket in the bell crank lever 8, the pivot pin 9 of the latter by passing through corresponding openings in both members serving to maintain the connection of these parts. The lower end of the downwardly projecting operating arm 8^k may, as shown, be conveniently provided with an eye permitting it to be connected to the uncoupling device or release rigging, which may be a simple bar, such as the member 11, that extends across the end of the car in the desired direction.

The knuckle 2 of the coupler is designed to cooperate with the lock 4 and knuckle opener 5. Its inner end, which is preferably fashioned with the well known hook that prevents its withdrawal in case its pivot pin 3 is broken while the coupler is locked and in service, is provided on its under side adjacent to its rear face with a downwardly projecting lug or flange 2^a which, when the knuckle moves inwardly to locked position engages the end 5^a of the knuckle opener arm 5 and forces the latter rearwardly, thus rotating the combined lock set and knuckle opener to a position in which the lock 4 is

permitted to drop vertically to locked position. Projecting upwardly from the upper face of the knuckle at its inner end is a lug or projection 2^b which, as more particularly shown in Figs. 1, 5 and 7, upon an outward rotation of the knuckle after the lock 4 has been brought to lockset position, engages the face 4^c of the lock adjacent to the knuckle and rotates said lock upon the shaft or axle 6, thus causing the lockset seat 4^a of the lock to be rotated out of supporting engagement with the corresponding lockset seat 1^a of the coupler head upon which it rests and simultaneously carrying the outer end of the lock 4 over the supporting shelf or wall 1^b of the coupler head, to thereby sustain the lock in unlocked position until, by a locking rotation of the knuckle 2, the depending lug or flange 2^a on the latter engages the outer end 5^a of the knuckle opener 5 and rotates the lock to a position where it may drop vertically.

The construction being substantially such as hereinbefore described, the operation of the device will be as follows. Assuming the parts to be in normal or coupled position, as shown in Figs. 1, 4 and 6, when the lock operating bell crank lever 8 is rotated in the proper direction upon its pivot pin 9, which rotation may be effected either through force applied to the operating arm 8^k that projects downwardly through the coupler head or by pulling upon the uncoupling bar 11 and thus transmitting the necessary power to the upper arm 8^d of the bell crank through the intermediacy of the link 10, the hooked upper end of the lock operating member 8 swings vertically upward, thus withdrawing the inclined face 8^e thereof from the vertical path of travel of the correspondingly inclined face 4^e of the lock. The curved face or cam 8^b on the upper side of the lower arm 8^a of the bell crank then engages the curved or rounded portion 4^e on the under side of the lock and the combined lock and knuckle opener member is raised to a position permitting the knuckle to rotate outwardly. If the knuckle 2 is prevented from rotating outwardly by reason of being in coupled engagement with a coupler on an adjacent car, the engagement of the outer end 5^a of the knuckle opener member with the tail of the knuckle prevents the knuckle opener 5 and lock 4 from rotating, the result being that when the turning force ceases to be applied to the bell crank lever, the lockset seat 4^a on the lock engages the corresponding lockset seat 1^a on the coupler head and the lock is supported in unlocked or lockset position, as shown in Figs. 3 and 5. With the lock in lockset position, a subsequent movement of the knuckle 2 causes the lockset seats 1^a and 4^a to be rotated out of engagement and the following inward or locking rotation of the

knuckle 2 rotates the lock to a position where it may drop vertically and lock the knuckle, as heretofore described.

If the knuckle 2 is free to rotate outwardly on its pivot pin 3 when the turning force is applied to the bell crank lock operating member 8, the combined lock and knuckle opener member first rises vertically in the manner heretofore described until the lock 4 is elevated sufficiently to permit an unlocking rotation of the knuckle whereupon, as the lock is then free to rotate upon the shaft 6, the outer end 5^a of the knuckle opener member 5 engages the rear face of the tail of the knuckle and forces said knuckle to execute an unlocking rotation upon its pivot pin, the parts assuming the positions illustrated in Fig. 2. After the knuckle is thus thrown to open position by means of the knuckle opener 5 an inward or locking rotation of the knuckle causes the combined lock and knuckle opener member to rotate in the opposite direction upon the shaft 6, thus moving the lock 4 out of supporting engagement with the shelf or wall 1^b of the coupler head and permitting said lock to drop vertically to locked position.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a car coupler, the combination with the coupler head, of a knuckle pivotally mounted thereon, a lock for said knuckle, said lock being movably mounted upon the coupler head so as to be capable of rectilinear and rotary movements, and a lock operating member engaging said lock to move the same and having a portion which extends transversely across the upper face of the lock when the said lock is in locked position, said transversely extending portion being adapted to engage and retain said lock in locked position and being movable out of locking engagement with said lock.

2. In a coupler, the combination with the coupler head, of a knuckle pivotally mounted thereon, a lock for said knuckle, a knuckle opener member rigidly connected to said lock, said lock and said knuckle opener member being movably mounted upon the coupler head so as to be capable of rectilinear and rotary movements, and a lock operating member which is movably mounted upon the coupler head and which is provided with an arm engaging the lock for moving the same to unlocked position and with an arm projecting over said lock.

3. In a car coupler, the combination with the coupler head, of a knuckle pivotally mounted thereon, a lock for said knuckle, a knuckle opener member rigidly connected to said lock and extending back of the tail of said knuckle, said lock and said knuckle opener member being vertically movable and horizontally rotatable, an axle upon

which said lock and knuckle opener member are mounted, and a bell crank lever pivotally mounted upon the coupler head and having an arm which engages the lock to lift the same and a portion which extends over the upper face of said lock.

4. In a car coupler, the combination with the coupler head, of a knuckle pivotally mounted thereon, a lock for said knuckle, a knuckle opener member movable by said lock, an axle, said lock being loosely journaled on said axle so as to be capable of successively moving upwardly, tilting and rotating thereon, and means for moving said lock upwardly and for rotating it upon said axle.

5. In a car coupler, the combination with the coupler head, of a knuckle pivotally mounted thereon, an upwardly movable and horizontally rotatable lock for said knuckle, a knuckle opener member rigidly connected to said lock and extending behind the tail of said knuckle, a lock operating member pivotally mounted on the coupler head, said lock operating member having an arm extending under the lock for moving the same both vertically and rotatably and having a hooked portion normally extending above the lock and across the path traversed by the latter when moving to unlocked position, means projecting out through the coupler head for actuating said lock operating member, and means carried by said knuckle for rotating said lock and said knuckle opener member to a position permitting the lock to drop to locked position.

6. In a car coupler, the combination with the coupler head, of a knuckle pivotally mounted thereon, a vertically movable and horizontally rotatable lock for said knuckle, a knuckle opener member rigidly connected to said lock and extending behind the tail of said knuckle, a bell-crank lever pivotally mounted on the coupler head, said lever having an arm extending under the lock, a portion projecting over the lock and an operating arm projecting downwardly through the coupler head, and means for actuating said bell-crank lever.

7. In a car coupler, the combination with the coupler head, of a knuckle pivotally mounted thereon, a vertically extending shaft mounted on said coupler head, a lock for said knuckle, said lock being upwardly movable and horizontally rotatable on said shaft, a knuckle opener member rigidly connected to said lock and extending behind the tail of said knuckle, a pivotally mounted lock operating member for moving said lock upwardly and for rotating the same, said lock operating member having an arm provided with a curved face which engages the under side of said lock and having a hooked upper portion which is adapted to engage said lock to maintain it in locked position,

a projection upon the upper face of said
knuckle for rotating the lock and knuckle
opener in one direction, and means mounted
on the knuckle whereby said lock and
5 knuckle opener member may be rotated in
the opposite direction.

8. A knuckle for car couplers employing
lock actuated knuckle openers, said knuckle
having a tail portion of hooked form, a
10 lock actuating projection on its upper face

at the inner end and rear side thereof, and
a downwardly projecting lug for engaging
a knuckle opener member.

In testimony whereof I affix my signature,
in the presence of two subscribing witnesses. 15

JOSEPH KELSO.

Witnesses:

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F. D. ECKER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
