J. KELSO.

CAR COUPLING.

APPLICATION FILED MAY 27, 1908.

913,213.

Patented Feb. 23, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

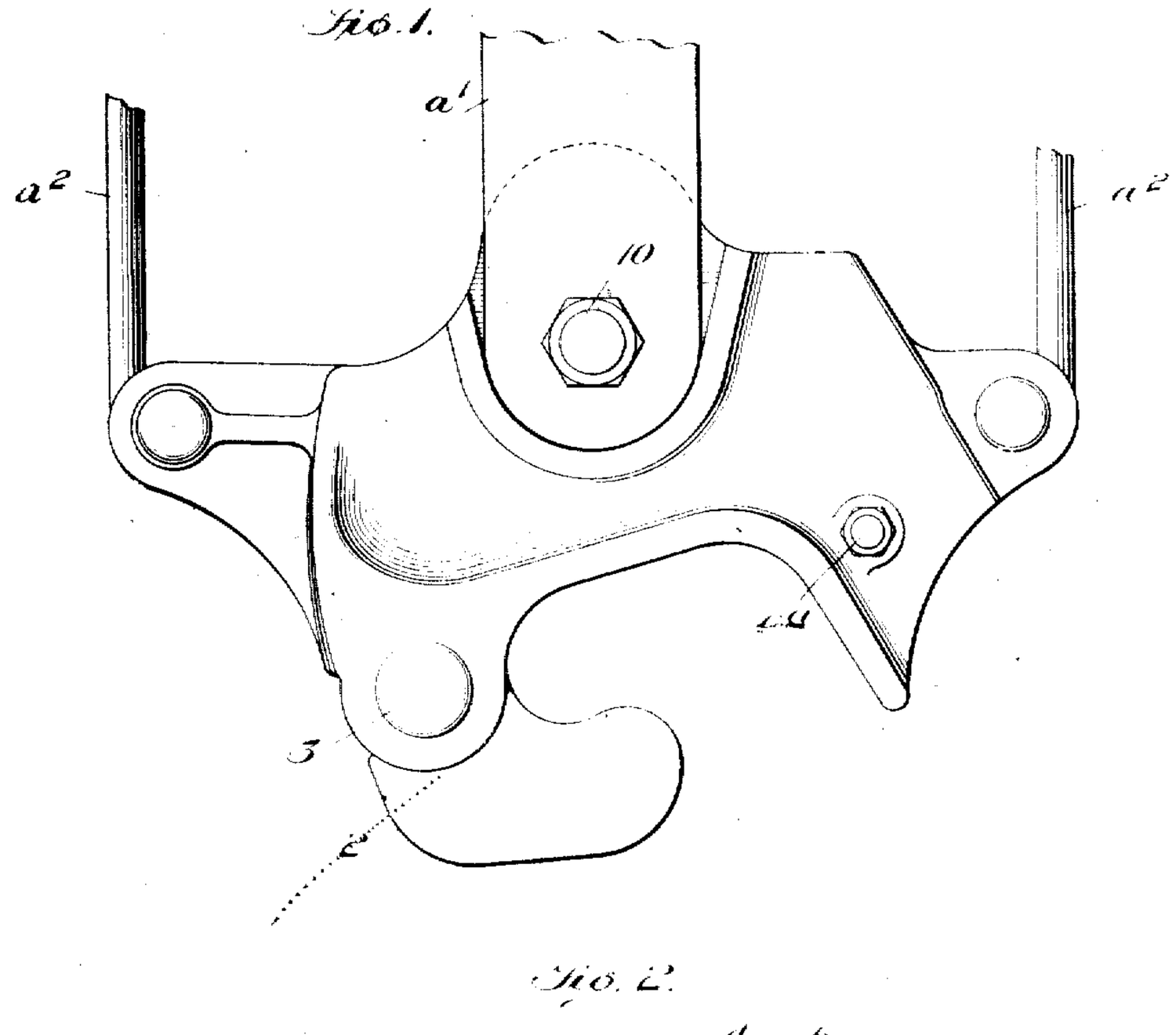
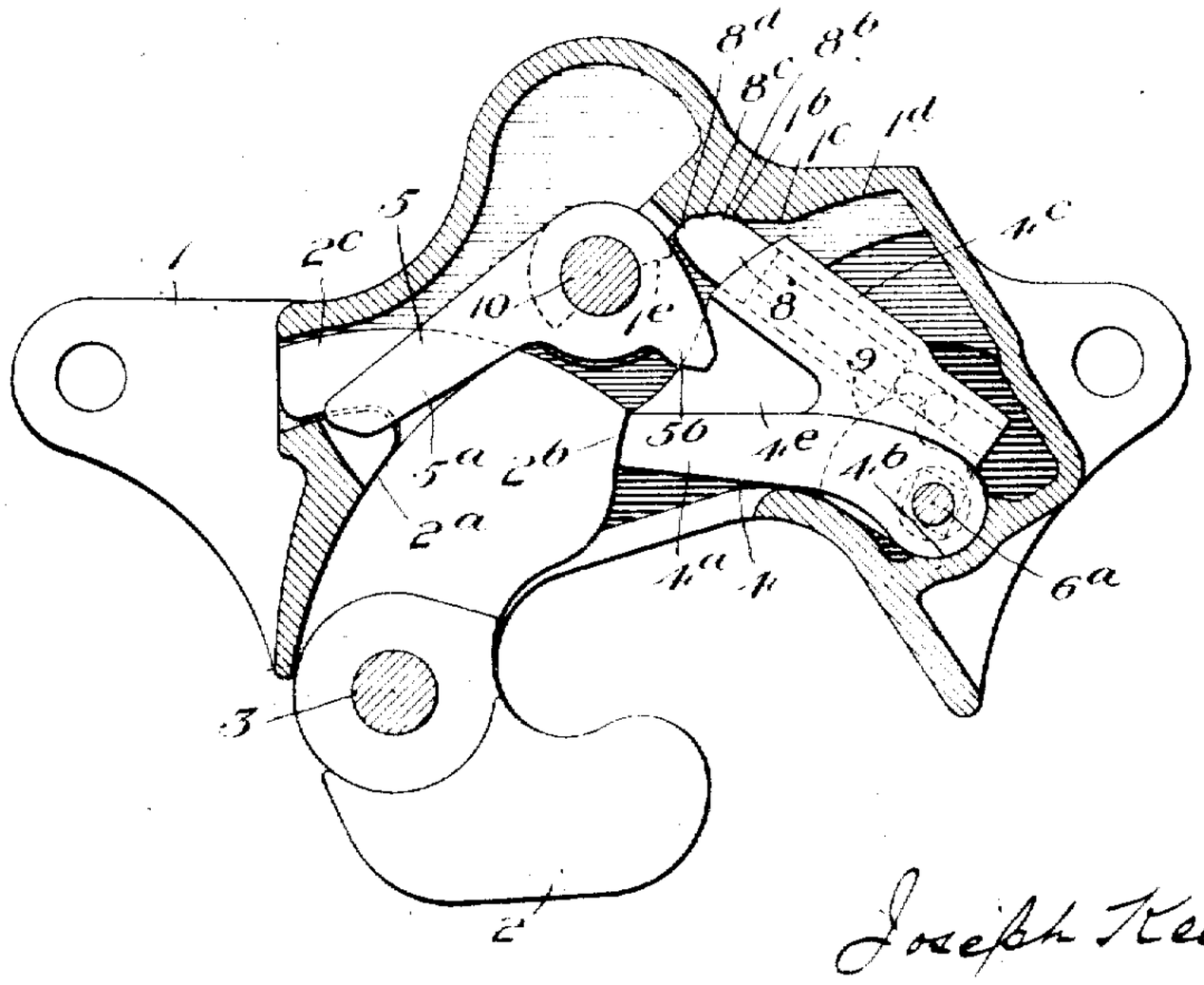


Fig. 2.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

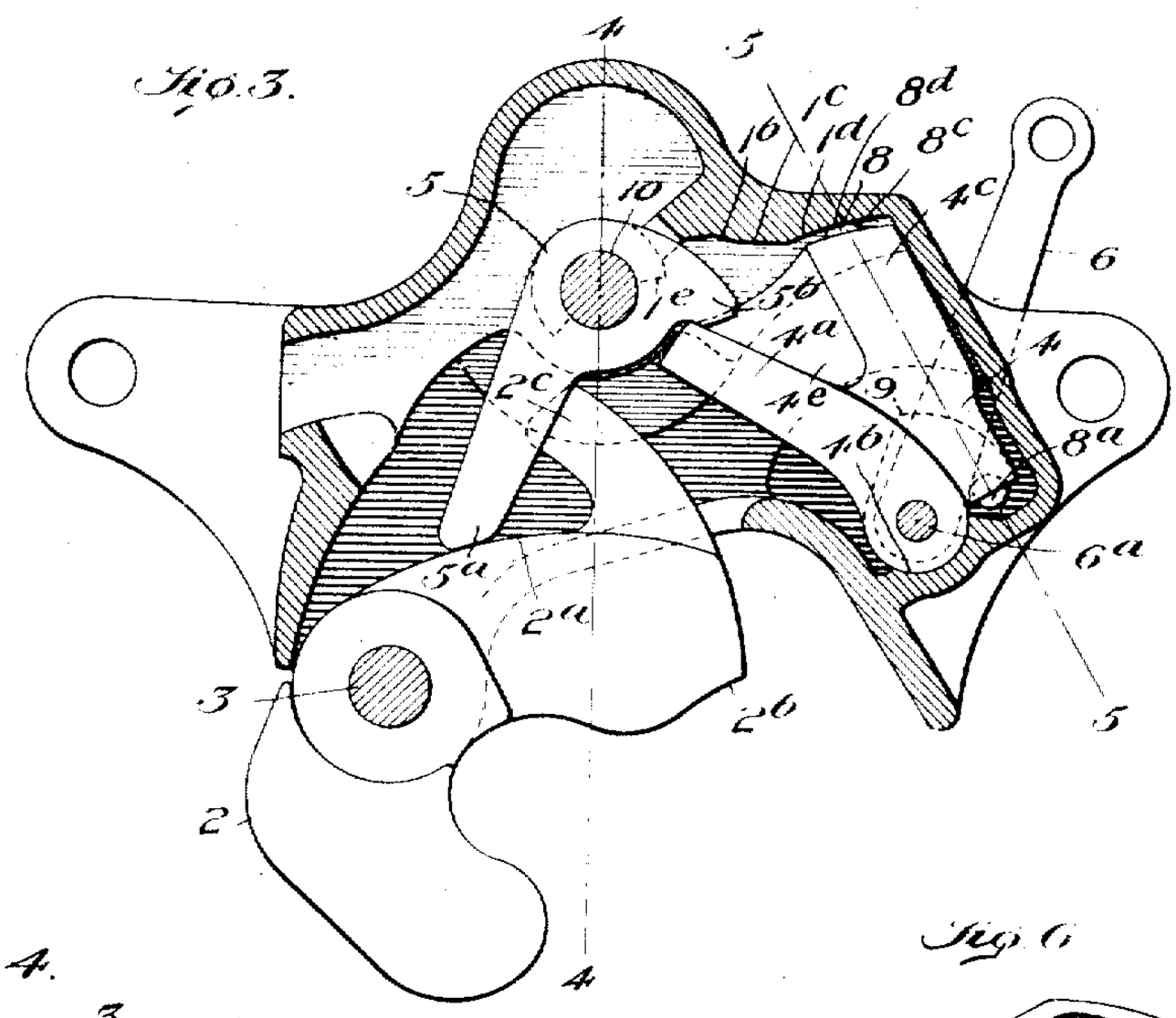


Fig. 4.

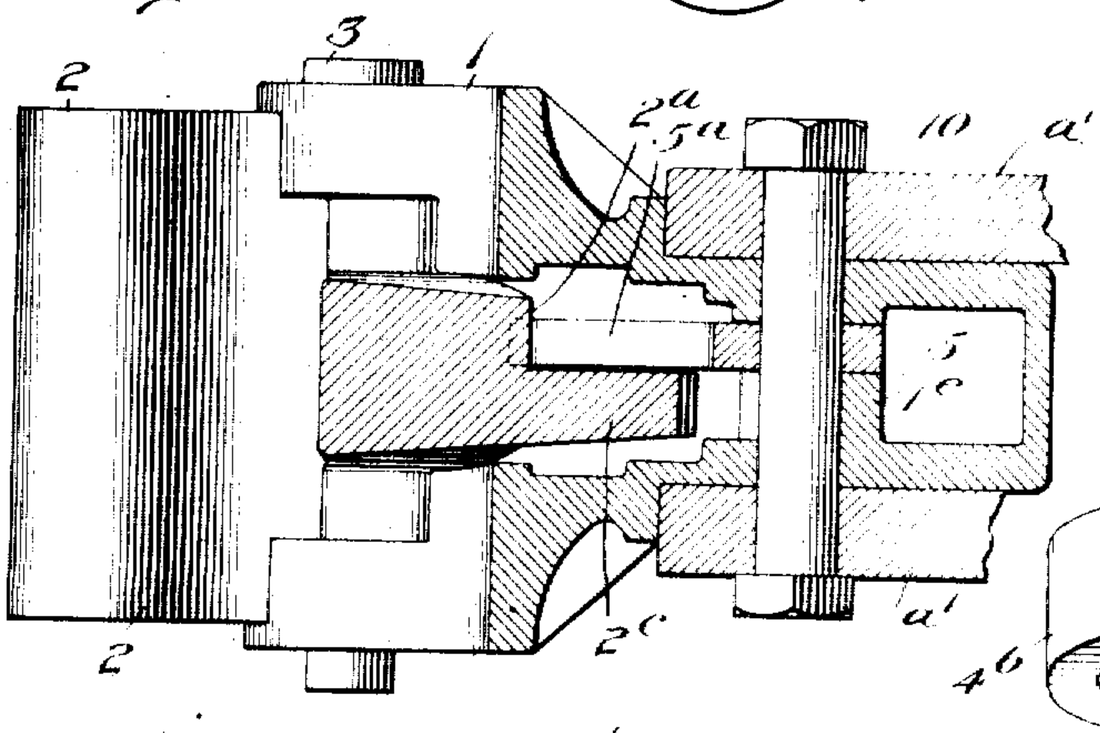


Fig. 6

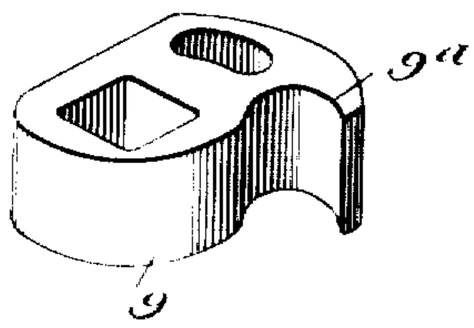


Fig. 7

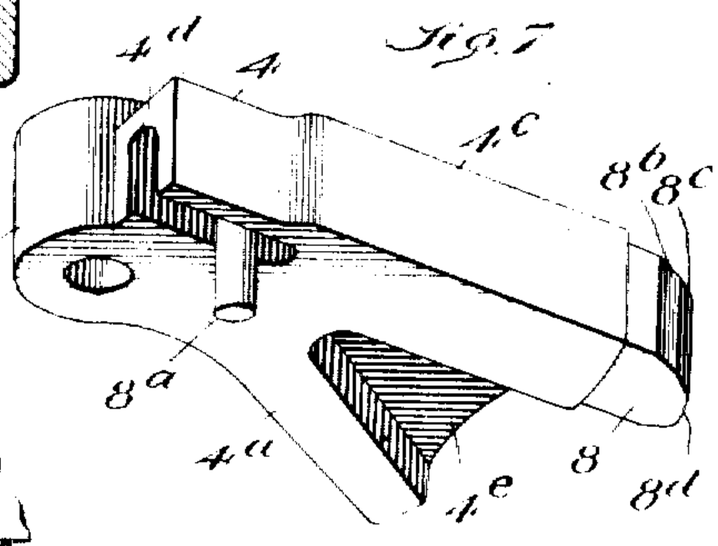
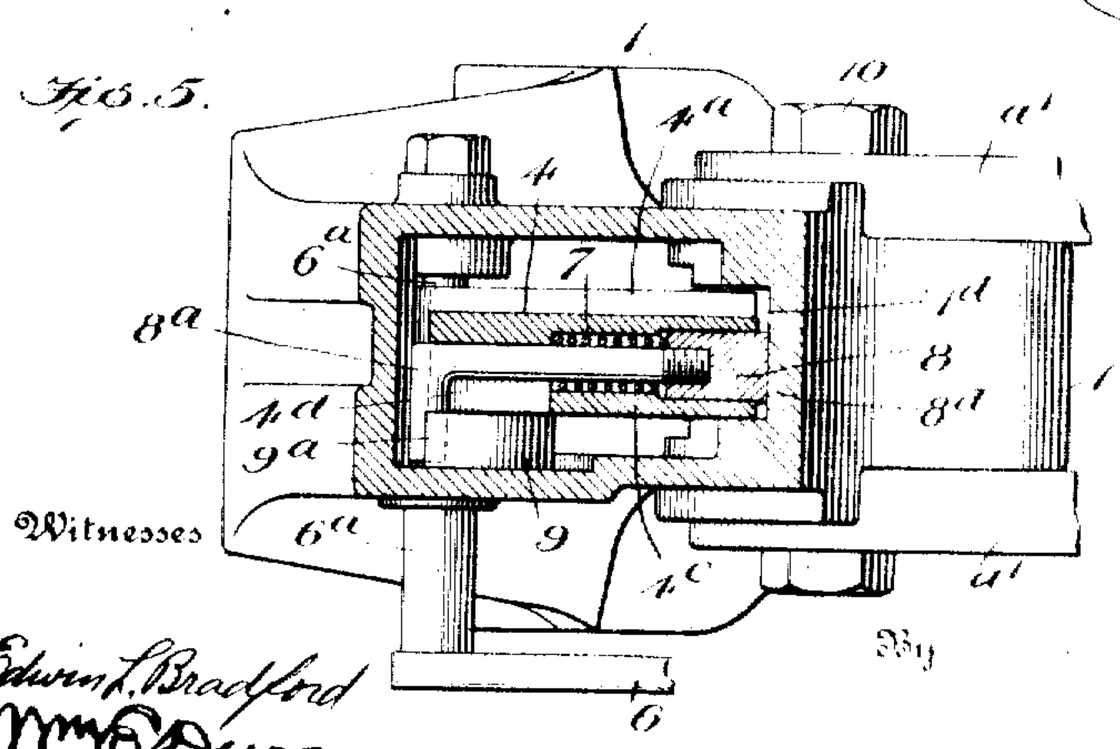


Fig. 5.



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CAR-COUPLING.

No. 913,213. Specification of Letters Patent. Patented Feb. 23, 1909.

Application filed May 27, 1908. Serial No. 435,291.

To all whom it may concern:

Be it known that I, JOSEPH KELSO, a citizen of the United States, residing at Pittsburg, 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 car couplers of the vertical plane type, and has for its object to provide simple, durable and efficient means for locking the coupler knuckle in coupled position for automatically and positively throwing said knuckle to open position when the locking member is actuated and the knuckle is free to revolve, and for locking said knuckle-locking member against accidental unlocking.

Although applicable generally to all classes of couplers, this invention is especially applicable to couplers in which the head is pivotally or otherwise movably connected to the coupler stem or stems, and it is in connection with such a coupler that I have illustrated my invention.

In the drawings chosen for the purpose of explaining my invention, the scope whereof is set forth in the claims, Figure 1 is a plan view of a car coupler embodying my invention, the coupler being shown in locked position; Fig. 2 is a view of the coupler shown in Fig. 1, the upper half of the coupler head being cut away, thus showing in plan the relative positions occupied by the several parts when the coupler is locked; Fig. 3 is a view similar to Fig. 2, but showing the relative positions which the several parts assume when the knuckle has been thrown open by the knuckle-opener; Fig. 4 is a vertical section taken in the plane of the line 4—4, Fig. 3; Fig. 5 is a vertical section taken in the plane of the line 5—5, Fig. 3; Fig. 6 is a detail perspective view of a part of the lock releasing device; and Fig. 7 is a detail perspective view of the lock and parts carried thereby.

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 the coupler head 1 is shown as pivotally connected to a center stem a^1 and side stems a^2, the arrangement being that of the well known three-stem coupler. The knuckle 2, which is rotatably mounted upon the coupler head by means of the knuckle-pin 3, is provided with a tail-piece having a rear vertical face 2^a which is preferably curved in order to most efficiently co-act with the knuckle-opener, said tail piece being also provided with a locking face or abutment 2^b for engaging the lock or catch 4 and with a hook portion 2^c which extends under the knuckle-opener member 5 and is adapted to engage a socket or opening in the coupler head to prevent the knuckle from being pulled out in the event the knuckle-pin 3 should be broken when the parts are in coupled relation.

Pivoted upon the guard arm side of the coupler head, preferably by means of a vertical bolt 6^a secured to or formed integral with the horizontally extending catch lever or lock lever 6, is the lock or catch 4 by which the knuckle 2 is locked in coupled position. As shown in Fig. 2, the relative arrangement of the catch 4 and knuckle 2 is such that when the parts are in coupled position the strain transmitted to the catch by an outward pull upon the knuckle has no tendency to cause an unlocking rotation of the said catch, all or substantially all of the crushing strain upon the catch being borne by the portion 4^a thereof which extends, when in such coupled position, from the pivot pin 6^a directly towards the locking face 2^b upon the knuckle. In order that the catch pivot pin 6^a may not be subjected to shearing forces when the locking member 4 is resisting an outward rotation of the knuckle, it is preferred to form the member 4 with a cylindrical bearing face 4^b that engages a correspondingly curved bearing face formed on the coupler head 1.

Mounted upon the catch 4 so as to be movable therewith is a spring 7 which, as will hereinafter more fully appear, serves not only to force said catch into locking engagement with the knuckle, but also to actuate the device by which said catch is directly locked against accidental unlocking. To this end the catch 4 is preferably formed

with a portion 4^c having an interior pocket or chamber the inner end of which is provided with a shoulder forming a seat for the spring 7 and the outer portion of which acts as a guide for the reciprocating catch locking member 8 that is yieldingly supported by said spring. The inner end of the spring inclosing chamber communicates with a downwardly and rearwardly opening vertical slot 4^d which permits the introduction of and serves as a guide for the angled portion 8^a of the catch locking member 8. The separate portions of the catch locking device may be connected by screw threads as shown or in any other suitable manner. The portions 4^a and 4^c of the lock or catch 4 are connected and braced about midway of their height by a horizontally extending web 4^e which thus forms a triangular shaped depression on the top of the lock for the reception of one end of the pivoted knuckle-opener member 5.

The outer end of the catch locking member 8 is preferably formed with beveled faces 8^b, 8^c and 8^d which are adapted to coact with the corresponding faces 1^b, 1^c and 1^d, respectively, formed upon the interior of the coupler head 1. The faces 1^b, 1^c, 8^b and 8^c are preferably plane, or substantially plane, while the coöperating faces 1^d and 8^d are preferably cylindrical, their center of curvature being at the pivot pin 6^a. When in its forward or catch locking position the outer end of the member 8 fits into a receiving socket in the coupler head which conforms to the shape of said member, the engagement of the inclined face 8^b of the spring pressed catch locking device 8 with the corresponding face 1^b of the coupler head serving not only to force the catch 4 toward the knuckle, but also to prevent an accidental unlocking rotation of said lock or catch 4. The engagement of the face 8^c of the member 8 with the corresponding face of the receiving socket formed in the coupler head also incidentally assists in performing the functions just referred to.

Mounted upon the vertical pin 6^a of the catch lever 6 so that it may rotate therewith is a catch releasing member 9 which is interposed between the catch 4 and the floor of the coupler head. This member may be advantageously fashioned as a small hook-like casting having a square aperture therein conforming to the corresponding squared section of the catch lever bolt 6^a, as shown. It may be cored to lighten it, as shown, and is so arranged with relation to the catch locking device 8 that its outer or hook portion 9^a is brought into engagement with the vertically extending angled portion 8^a of said member 8 when the catch lever 6 is turned from a locked to an unlocked position. The turning movement of the catch releasing member 9, when the latter is in engagement with the catch locking device 8, first causes the said catch locking device to be retracted sufficiently to release the catch 4 and permit it to be rotated towards an unlocked position, and then, upon the continuation of such turning movement, operates to rotate the catch 4 itself, the member 8, through the coöperation of the angled portion 8^a thereof with the hook 9^a of the member 9, being retracted as may be necessary to permit the unlocking rotation of the catch 4 to progress.

The pivoted knuckle opener member 5 is preferably in the form of a bell crank lever one arm of which, 5^a, extends behind the curved vertical wall 2^a of the knuckle and is adapted to co-act therewith in throwing the knuckle to an open position, and the other arm, 5^b, of which is arranged to project into the triangular depression upon the upper face of the catch 4 so that an extended unlocking movement of the said catch causes the portion 4^a thereof to engage said arm 5^b to thus cause the rotation of the knuckle-opener and the consequent opening of the knuckle. As shown, it is preferred to curve the face 2^a of the knuckle with which the knuckle-opener arm 5^a engages, as such a construction enables these parts to coöperate without any substantial friction and the leverage operating to throw the knuckle open is greatest at the beginning of the knuckle opening operation.

The vertical pin 10 by which the knuckle-opener member is rotatably secured to the coupler head may also serve as a means of pivotally connecting a stem such as a^1 to said head. In order that the locking member or catch 4 may be easily placed in its proper position in the coupler head when the several parts of the coupler are being assembled, the pivot boss 1^e, which is formed upon the coupler head for the purpose of supporting the knuckle-opener 5 adjacent to the pivot pin 10, is fashioned as a segment of an annulus the open part whereof, as shown in Figs. 2, 3 and 4, faces towards the front of the coupler head.

The construction being substantially such as hereinbefore pointed out, the operation of the device will be as follows. Assuming the coupler to be locked, as shown in Figs. 1 and 2, a pull exerted in the proper direction upon the catch lever 6 will cause the catch locking member 8 to be retracted sufficiently to permit of an unlocking rotation of the catch 4, as heretofore described. If the coupler is in engagement with another coupler, at the time the catch lever 6 is actuated, the knuckle 2 cannot be thrown to an open position, and hence the unlocking rotation of the catch 4 is arrested when the knuckle-opener 5 is simultaneously in engagement with said knuckle and the locking portion 4^a of said catch. This occurs imme-

diately after the catch 4 has assumed a position permitting the knuckle to move to an open position. When the catch 4 is in this position the inclined face 8^c upon the spring-pressed catch locking device 8 is in engagement with the correspondingly inclined face 1^c formed upon the coupler head 1, so that, should the unlocking pull upon the catch lever 6 be released before the knuckle 2 is moved from its locked position, the spring 7 acting through the said incline 1^c and 8^c would cause the catch 4 to immediately reassume a locked position. Should, however, the knuckle 2 be rotated partially or fully to its open position while the catch 4 is in the unlocked position described, the curved rear end of the knuckle tail will pass in front of said catch and thus prevent it from returning to a locked position until the knuckle again assumes a fully closed position.

If the knuckle 2 is free to rotate outwardly when an unlocking pull is exerted upon the catch lever 6, the catch 4 after coming into engagement with the knuckle-opener 5, as heretofore described, will have an extended unlocking rotation, the knuckle-opener 5 being thereby caused to rotate upon its pivot pin 10 and throw the knuckle open. At the end of the knuckle opening operation the several parts of the coupler will occupy the positions shown in Figs. 3, 4 and 5. As the cylindrical faces 1^d and 8^d of the coupler head 1 and catch locking device 8, respectively, are at this time in engagement, and as the center of curvature of these faces is the pivotal center of the catch 4, the spring 7 has no tendency to return said catch to its locked position. When the knuckle 2 is returned to its closed position after having been opened by the knuckle-opener 5, the tail of said knuckle acts upon said knuckle-opener and causes it to be returned to the position it normally occupies when the coupler is locked. During this rotation of the knuckle-opener to its initial position the arm 5^b thereof by engaging the locking portion 4^a of the catch 4 causes the latter to be positively rotated toward its locking position until the inclined face 8^c upon the catch locking device 8 comes into engagement with the corresponding face 1^c upon the coupler head, whereupon the spring 7 operates to complete the locking rotation of the catch 4, as previously explained.

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

1. In a car coupler, the combination with a coupler head, of a knuckle pivotally mounted thereon, a catch for locking said knuckle in coupled position, a spring operating to force said catch to locked position, and means for locking said catch in locked position.

2. In a car coupler, the combination with a coupler head, of a knuckle pivotally mounted thereon, a pivoted catch for locking said knuckle in coupled position, a device mounted upon the catch for locking said catch in locked position and a spring carried by said catch, said spring operating to force both said catch and said device for locking said catch to their locked positions.

3. In a car coupler, the combination with a coupler head, of a knuckle pivotally mounted thereon, a catch for locking said knuckle in coupled position, said catch being pivotally mounted upon said head, and a spring operating to force said catch to locked position, said spring being mounted upon said catch and being rotatable therewith.

4. In a car coupler, the combination with a coupler head, of a knuckle pivotally mounted thereon, a pivoted catch for locking said knuckle in coupled position, a spring operating to force said catch to a locked position, and means whereby said catch may be retained in an unlocked position without any tendency to rotate.

5. In a car coupler, the combination with a coupler head having beveled faces, of a knuckle pivotally mounted thereon, a catch for locking said knuckle in coupled position, said catch being pivotally mounted upon said head and being provided with a chambered portion, a spring mounted in the chambered portion of said catch, and a reciprocating catch locking device mounted upon said catch and yieldingly supported by said spring, said catch locking device having beveled faces adapted to co-act with corresponding faces formed upon the coupler head.

6. In a car coupler, the combination with a coupler head, of a knuckle pivotally mounted thereon, a rotatable catch for locking said knuckle in coupled position, a catch locking device for locking said catch in locked position, a spring operating to force said catch to locked position, and means operating to actuate said catch locking device and then to rotate said catch to an unlocked position.

7. In a car coupler, the combination with a coupler head, of a knuckle pivotally mounted thereon, a catch for locking said knuckle in coupled position, a device for locking said catch in locked position, and a spring operating to force said catch to locked position and also to force said catch locking device to locked position.

8. In a car coupler, the combination with a coupler head, of a knuckle pivotally mounted thereon, a catch for locking said knuckle in coupled position, said catch being mounted upon a rotatable pivot pin, a spring mounted upon said catch, a catch locking device mounted upon said catch and

yieldingly supported by said spring, and a catch releasing member mounted upon said pivot pin and rotatable therewith, said catch releasing member being adapted to engage and actuate said catch locking device and to rotate said catch to unlocked position.

9. In a car coupler, the combination with a coupler head, of a knuckle pivotally mounted thereon, a pivoted horizontally movable catch for locking said knuckle in coupled position, a spring operating to force said catch to locked position, and a pivoted knuckle-opener which is adapted to engage said catch and said knuckle, said catch by an extended unlocking movement operating to positively rotate said knuckle-opener.

10. In a car coupler, the combination with a coupler head, of a knuckle pivotally mounted thereon, a horizontally rotatable catch for locking said knuckle in coupled position, a catch locking device carried by said catch, and a knuckle-opener which is adapted to be actuated by said catch.

11. In a car coupler, the combination with a coupler head, of a knuckle pivotally mounted thereon, a pivoted catch having a locking portion and a chambered portion, a catch locking device mounted in the chambered portion of said catch, and a knuckle-opener lever, one arm of said lever being adapted to engage the knuckle and the other arm of said lever being interposed between the locking portion and chambered portion of said catch.

12. In a car coupler, the combination with a coupler head, of a knuckle pivotally mounted thereon, a pivoted catch for locking said knuckle in coupled position, a catch locking device mounted upon said catch, a spring operating to force said catch to locked position, said spring also operating to yieldingly support said catch locking device, and a knuckle-opener member which is adapted to be actuated by an unlocking rotation of said catch.

13. In a car coupler, the combination with a coupler head, of a plurality of stems pivotally connected thereto, a knuckle pivotally mounted upon said head, a catch for locking said knuckle in coupled position, and a knuckle opener member which is pivotally mounted upon said head at the point of pivotal connection of one of said stems.

14. In a car coupler, the combination with a coupler head, of a knuckle pivotally mounted thereon, a catch for locking said knuckle in coupled position, a knuckle-opener which is adapted to be actuated by said catch to throw said knuckle open, said knuckle-opener operating to positively move said catch toward its locking position when said knuckle is returned to coupled position after having been opened by said knuckle-opener, a spring, and means whereby said spring operates to complete the locking movement of said catch independently of said knuckle-opener.

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

JOSEPH KELSO.

Witnesses:
F. D. ECKER,
J. W. HARTLEY.