No. 787,991. PATENTED APR. 25, 1905.

W. McCONWAY, JR.

CAR COUPLING.

APPLICATION FILED OCT. 11, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

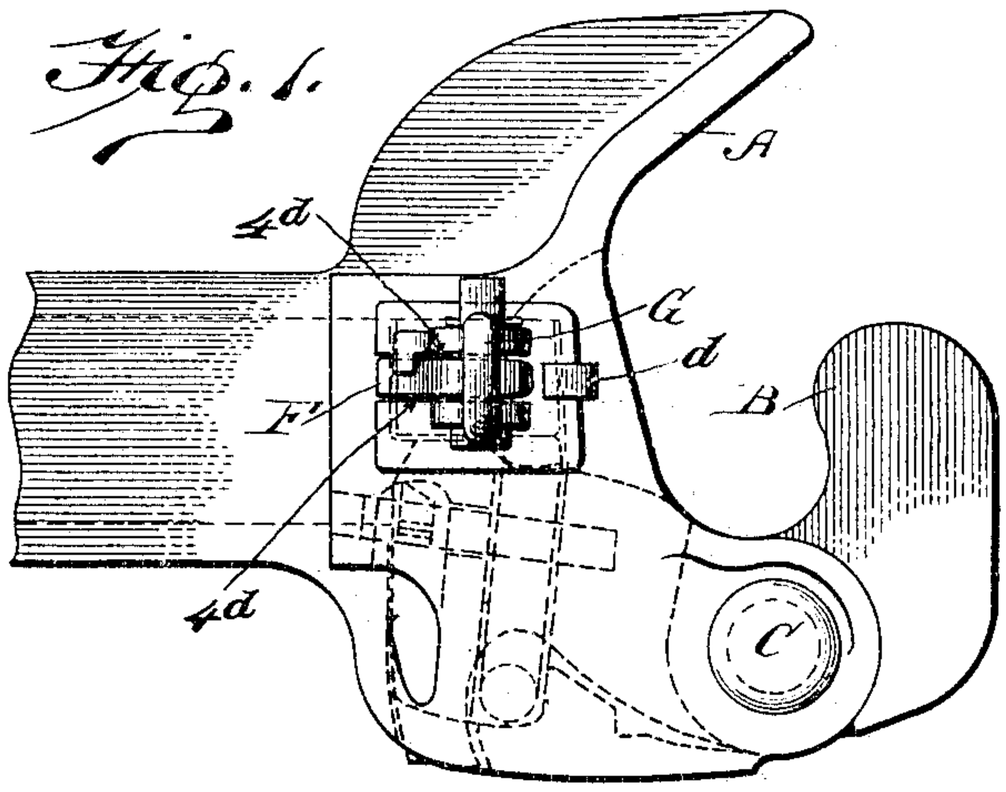


Fig. 8.

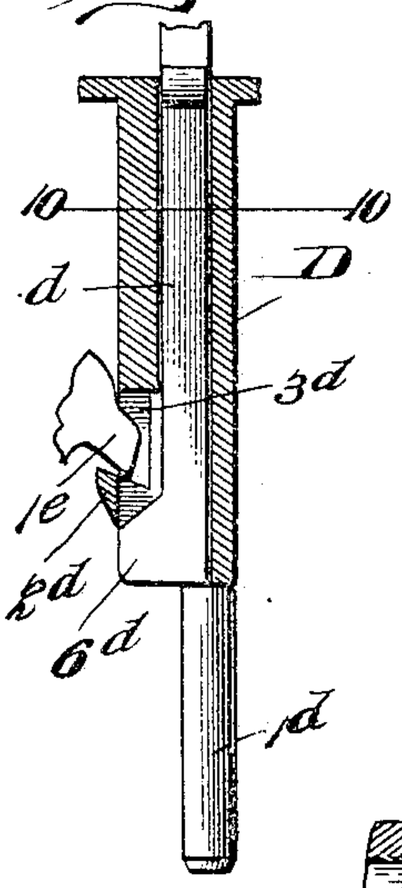


Fig. 9.

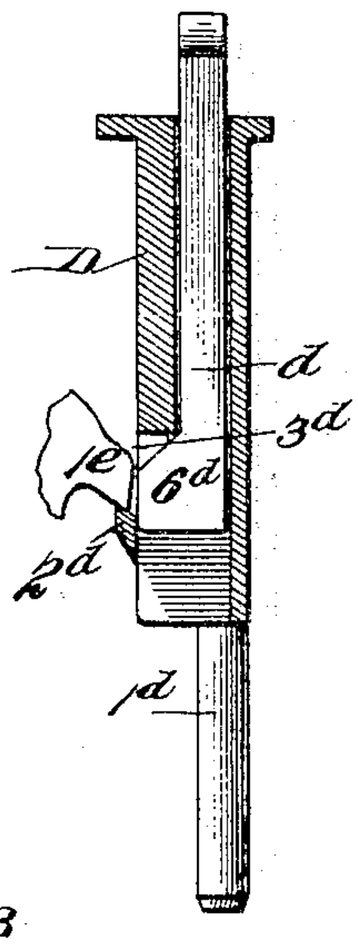


Fig. K.

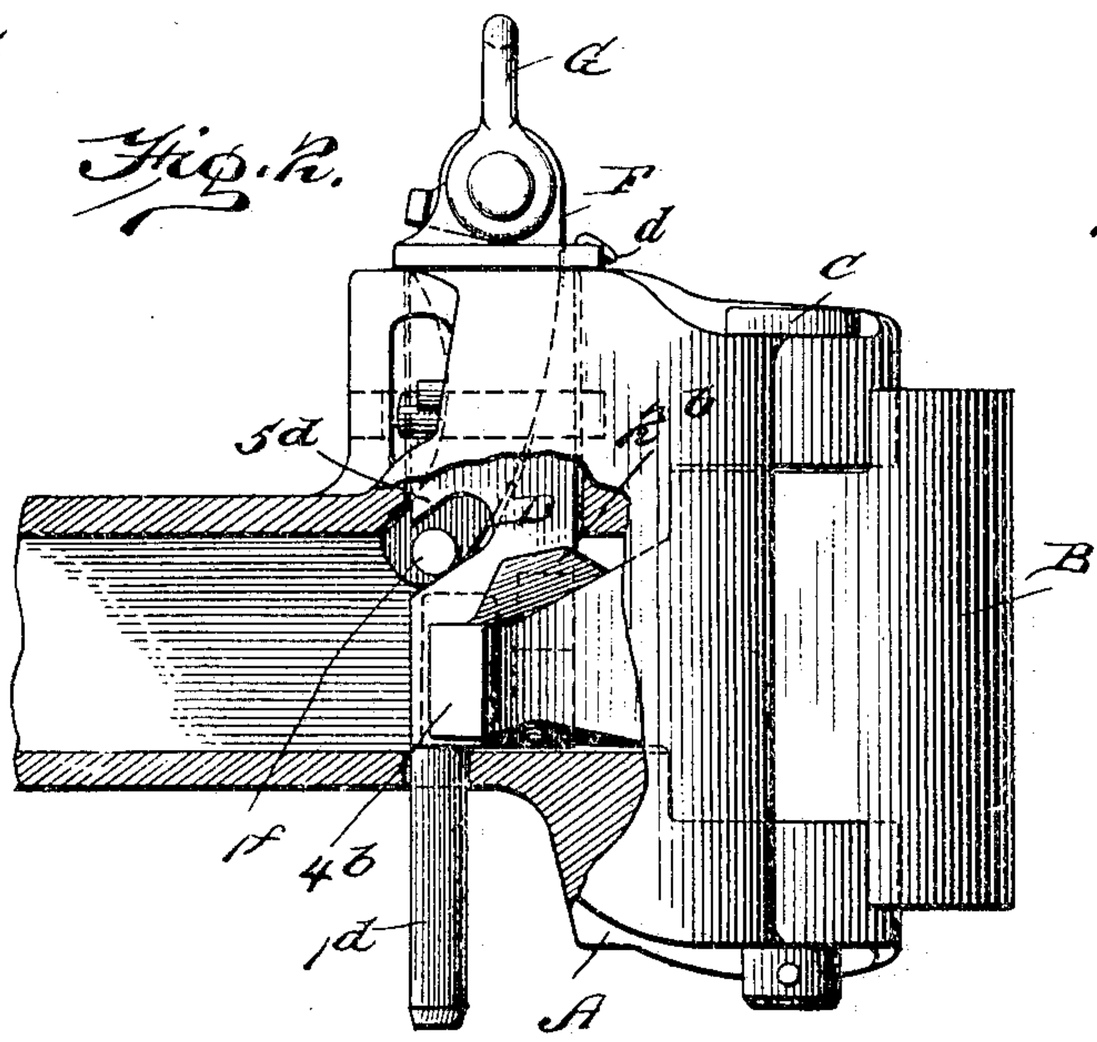
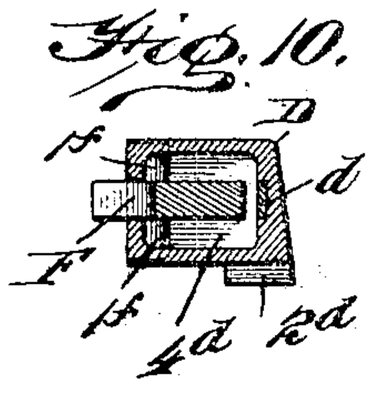


Fig. 10.



WITNESSES:

H. G. Dieterich

G. F. Ritter

INVENTOR

William McConway, Jr.

BY F. F. Ritter, Jr.

Attorney

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2 SHEETS—SHEET 2.

Fig. 3.

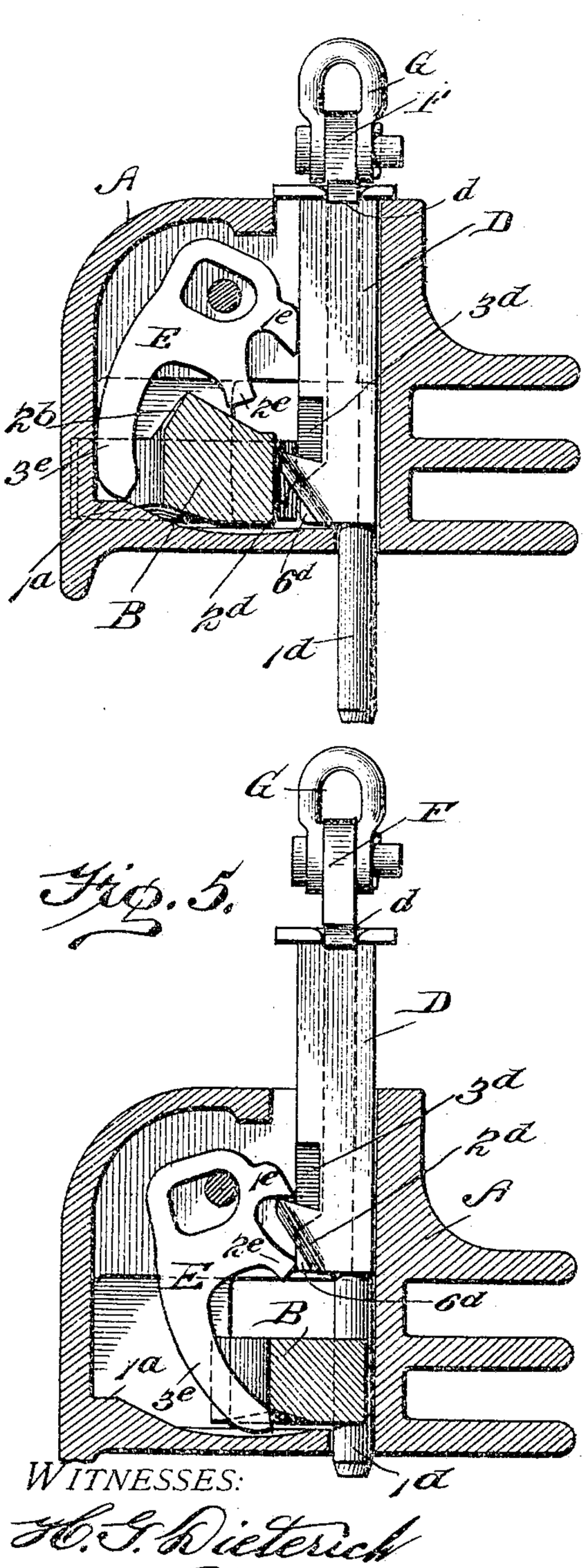


Fig. 4.

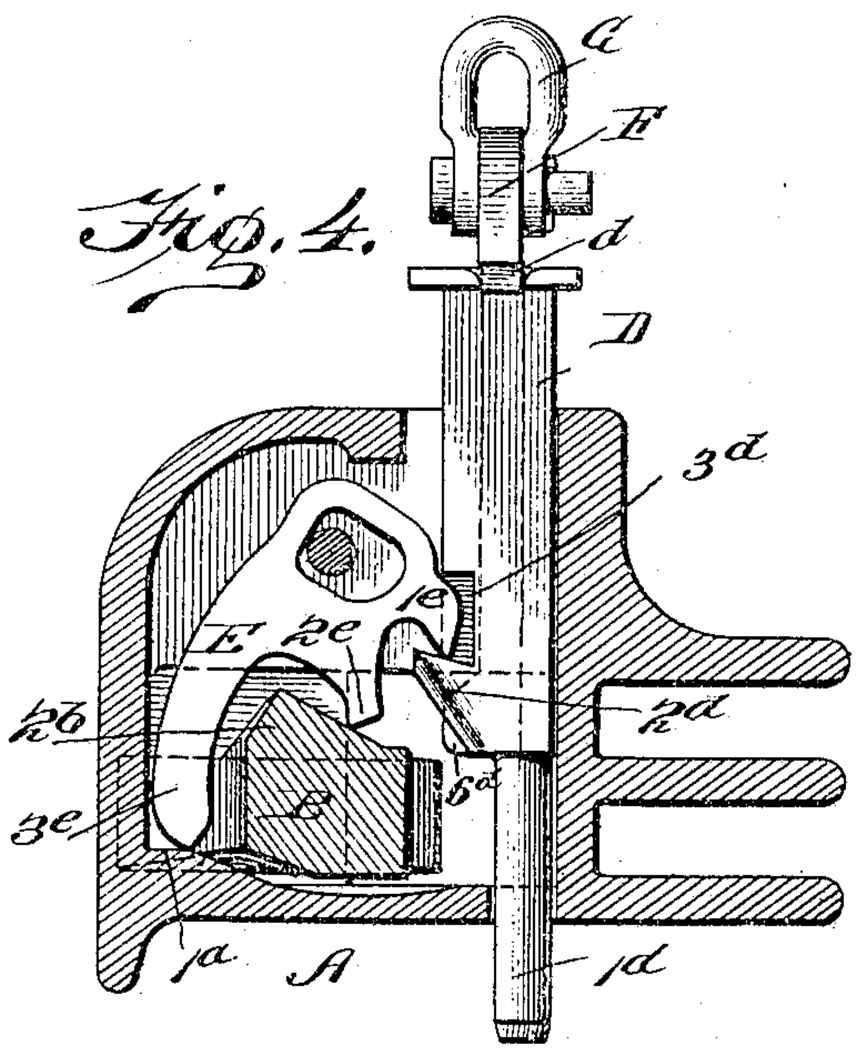


Fig. 5.

Fig. 6.

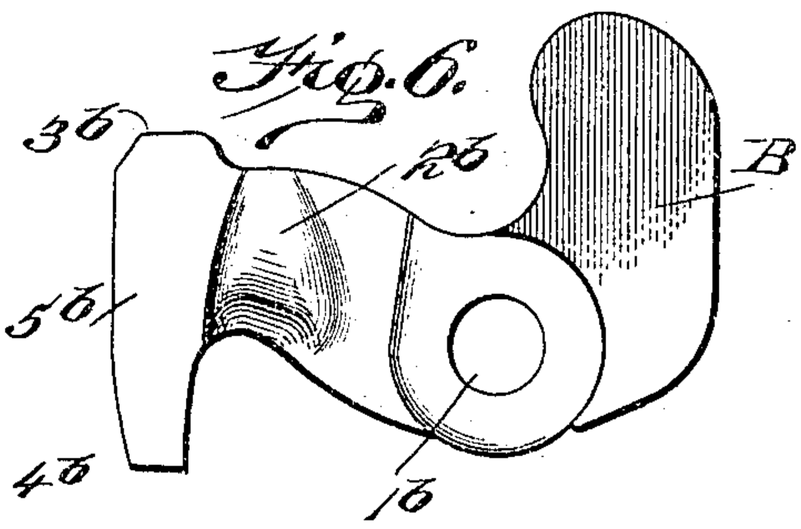
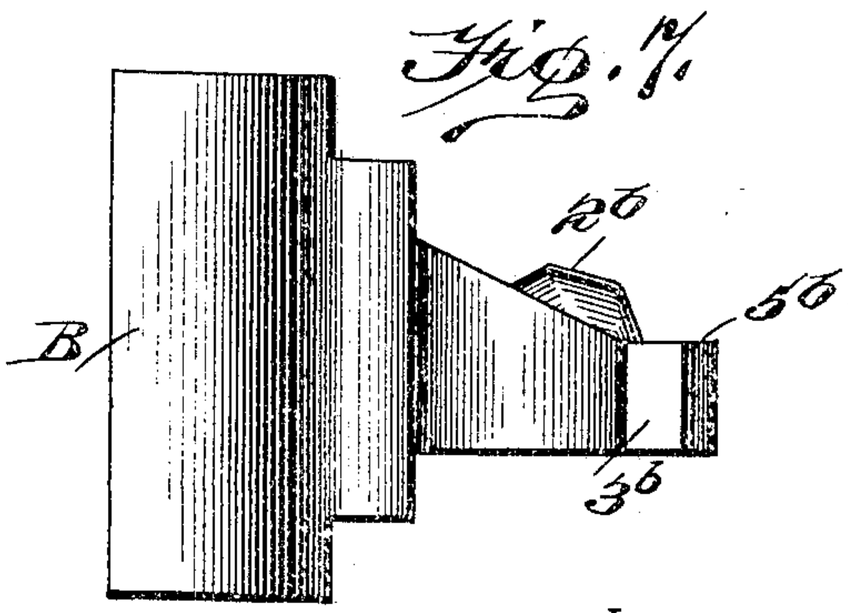


Fig. 7.



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H. L. Dieterich

G. P. Ritter

INVENTOR

William McConway Jr.

BY F. N. Ritter Jr.

Attorney

No. 787,991. Patented April 25, 1905.

UNITED STATES PATENT OFFICE.

WILLIAM McCONWAY, JR., OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE McCONWAY & TORLEY COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 787,991, dated April 25, 1905.

Application filed October 11, 1904. Serial No. 228,051.

To all whom it may concern:

Be it known that I, WILLIAM McCONWAY, Jr., 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 hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of a coupler embodying my invention, the interior portions thereof being shown in dotted lines. Fig. 2 is a side elevation of the device, a portion of the drawhead thereof being broken away and the lock-set and knuckle-opener member being removed. Fig. 3 is a transverse vertical section in the plane of the outer face of the lock, the parts being in locked or coupled relation. Fig. 4 is a transverse vertical section in the plane of the outer face of the lock, illustrating the relative positions of the several parts when the lock is set or supported in an unlocked position prior to the opening movement of the knuckle. Fig. 5 is a transverse vertical section in the plane of the outer face of the lock, the knuckle having been opened by the knuckle-opening mechanism. Fig. 6 is a plan view of the knuckle. Fig. 7 is a side elevation of the knuckle viewed from the guard-arm side of the coupler. Fig. 8 is a vertical section of the lock in the plane of the lock-set release device, a portion of the lock-set member being shown in supporting engagement with said lock. Fig. 9 is a vertical section of the lock in the plane of the lock-set release device, showing the relative positions of the lock-set member and the lock-set release device when the former is forced out of supporting engagement with the lock by actuating such lock-set release device. Fig. 10 is a horizontal section of the lock, taken on the line 10 10, Fig. 8.

Like symbols refer to like parts wherever they occur.

My invention relates to the construction of car-couplers of the vertical-plane or Janney type, and has for its object the production of a structure consisting of few and simple parts which shall effectively support the lock or knuckle-locking member in position to permit the subsequent opening movement of the knuckle and which shall eject or open the knuckle when the latter is free to rotate, the construction of the several elements of the device and the relative arrangement thereof being such that a strong rigid coupler is obtained in which the metal is efficiently disposed.

The invention, generally stated, embraces a lock-set and knuckle-opener member having a detent-finger which in the normal or locked position of the parts is arranged out of the path of movement of the lock and which gravitates or otherwise moves into supporting engagement with the lock to retain the latter in an unlocked position and in combination therewith a knuckle, the tailpiece whereof coacts with said lock-set and knuckle-opener member, whereby the detent-finger of the latter is caused to be disengaged from the lock to release the same upon the opening movement of the knuckle, and a construction including such a combination involves the main feature of my invention.

There are other minor features of invention residing in particular combinations and elemental construction, all as will hereinafter more fully appear and be particularly pointed out in the claims.

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 chosen to illustrate my invention, the scope whereof is pointed out in the claims, A is a coupler-head to which the knuckle B is pivotally attached by the usual knuckle-pin C, said draw-head A being preferably provided with an opening in the upper wall to permit the introduction of the lock or locking-pin D and being also provided with an opening in the floor or lower wall of the coupler-head corresponding substantially to the guide-finger or extension 1^d with which the lock D is or may be provided.

The interior of the draw-head A at a point

upon the floor thereof adjacent to the usual well-known opening in the side wall through which the hook portion of the knuckle-tail projects is preferably provided with an abutment 1^a for the support of the lower end of the lock-set and knuckle-opener member E when the parts are in a locked position, said abutment 1^a being inclined downwardly toward the lock, for a purpose which will hereinafter more fully appear.

The lock D, which is preferably a vertically-sliding pin guided in its locking and unlocking movements by the lock-openings in the upper and lower walls of the coupler-head A, is provided, if desired, with an extension or guide-finger 1^d to aid in maintaining the proper relation of said lock with respect to the other parts of the device.

That face of the body portion of the lock D which is contiguous to the locking-face 3^b of the knuckle B is provided at or near its lower end with an ear or lug 2^d, preferably extending beyond the face of said lock, and also with a notch or pocket 3^d, adapted to receive a detent arm or finger of the lock-set and knuckle-opener member E; but, if desired, the said lug 2^d and notch or pocket 3^d may be otherwise formed or located on the locking-pin D.

The upper part of the body portion of the lock D is preferably formed with a vertically-extending bifurcating slot or channel 4^d, which may, if desired, be broadened out within the interior of the lock, thus decreasing the weight of said lock. Within the channel or chamber thus formed are contained certain safety and emergency devices, such bifurcating slot or channel permitting the facile introduction of the said devices and permitting their contact with the coupler-head, for a purpose and in a manner which will presently more fully appear. The lock D is also preferably provided with a lock-set release member or cam-slide *d*, having a cam-lug or enlarged portion 6^d, which when the said lock-set release device is actuated is adapted to project into the notch 3^d of the lock, and thus force the detent-finger 1^e of the lock-set member E out of supporting engagement with said lock, said release member *d* being preferably housed within the lock in a slot or pocket which opens into the notch 3^d and which also preferably communicates with the bifurcating slot or channel 4^d for at least a portion of its length; but, if desired, such slot and such bifurcating channel may be made wholly independent.

Within the coupler-head A and preferably guided therein between vertical transverse walls is the member E, said member E being so loosely pivoted or secured to the coupler-head by a pin-and-slot or other suitable connection that it may gravitate or otherwise move into supporting engagement with the lock D when the latter is raised, and the slot of said pin-and-slot connection being preferably so enlarged with respect to the pin that the member E may have a limited movement in any direction in the plane of its operation. In order to retain the lock in position to permit the subsequent unlocking movement of the knuckle and for the purpose of providing a means by which the unlocking movement of the pin D may be transmitted through the lock-set and knuckle-opener member E to eject or open the knuckle, the said member E is provided at its upper end adjacent to the lock with suitable means—as, for example, a lug, projection, or detent-finger 1^e, which when the lock D is in unlocked position is adapted to engage the notch or socket 3^d above the projecting ear or lug 2^d, and thereby support the lock, the normal position of the said detent-finger 1^e when the lock D is in locked position being preferably to one side and out of the path of movement of the said lock.

Upon the lock-set and knuckle-opener member E and at a point below and sufficiently removed from the detent-finger or lug 1^e to permit the play of the ear 2^d of the lock D is preferably formed a lug or trip-finger 2^e, which depends in the path of the knuckle and by coacting with a suitable projection upon the knuckle during the opening movement thereof causes the detent-finger 1^e to be disengaged from supporting engagement with the notch 3^d of the lock D, the latter being thereafter supported upon a suitable shelf formed upon the knuckle-tail until such time as the knuckle is returned to a closed or locked position. The lock-set and knuckle-opener member E is also provided with an arm 3^e, which extends downwardly behind the knuckle on the side opposite the lock and which when the several parts are in the normal or locked position rests upon the abutment 1^a of the coupler-head A, said arm 3^e being preferably longer than the detent-finger 1^e in order that a comparatively slight movement of the lock D may communicate an extended opening movement to the knuckle B.

In lieu of the lock-set release member *d*, the member E, if desired, may be also provided with an arm or extension extending outwardly through a suitable slot in the coupler-head, thus enabling the lock to be returned to a locked position after it has been set in an unlocked position and before the knuckle has been opened.

The knuckle B, which is pivotally secured to the coupler-head by the knuckle-pin C passing through the pivot-pin hole 1^b, has formed upon the upper surface of the tail thereof a projection 2^b, which is preferably formed with inclined faces and which, upon an opening movement of the knuckle after the lock D is set or supported in an unlocked position, coacts with the trip-finger 2^e of the member E to cause a rotation thereof, resulting in the release of the lock. Beyond the trip projection 2^b the inner end of the tail of the

knuckle is provided with a lock-supporting shelf 5^b of general wedge form, the outer border whereof is eccentric to the pivot-pin hole 1^b, and this part of the tail of the knuckle is formed in such manner that an extended locking-face 3^b or washer-like projection is provided for bearing upon the lock D, behind which a portion of the lock D stands when in locked position, and by reason of the eccentricity of the tail of the knuckle a larger wearing-surface is provided for that portion of the lock-supporting shelf which receives the greatest wear, the leverage of the lock D about the knuckle-pin is increased, thus permitting a lighter lock to be used, and the hook portion 4^b of the knuckle-tail is diminished in size, so that the usual opening or socket of the head A, which such hook portion engages, is proportionately decreased, thereby increasing the strength of the coupler-head at this point.

Housed within the bifurcating channel 4^d of the body portion of the locking member D is a lever or lifting member F, which by engaging a portion of the coupler-head prevents accidental unlocking of the coupler when the device is in service and which also serves to raise said lock to release the knuckle should the coupler be separated from its connection with the car to which it is attached, said member F being preferably convexly curved toward the front of the coupler-head and provided on each side at or near its lower end with a boss, pintle, or pin 1^f, which is adapted to have sliding and pivotal or rotating engagement with inclined slots or guideways 5^d of the lock D, extending inwardly and upwardly from the rear face thereof, for a purpose which will hereinafter appear.

G is a clevis attached to the upper end of the member F, whereby connection may be made with the usual uncoupling-chain and uncoupling-lever; but, if desired, the member F may be omitted and the uncoupling-chain be attached directly to the lock D.

The construction being substantially such as hereinbefore pointed out, the operation of the device will be as follows: Assuming the several parts of the device to be in locked or coupled relation, as shown in Figs. 1, 2, and 3, an upward pull upon the clevis G causes an upward movement of the attached member F independent of the lock D, the lower end of said member F being thus withdrawn from engagement with the coupler-head. When the bosses 1^f finally engage the upper end of the inclined guideways 5^d of the lock D, the said lock D and member F rise coextensively until the notch 3^d of the former is brought into register with the detent-finger 1^e of the lock-set and knuckle-opener member E, when the latter gravitates or otherwise moves toward the lock and the said detent-finger 1^e thereof enters the notch 3^d. If now the knuckle be not free to rotate and the upward pull upon the clevis G be released, the several parts will be in the relation shown in Fig. 4, and the lock D will be retained in an unlocked position by the supporting engagement of the detent-finger 1^e, such relative position of the parts being maintained by reason of the fact that the knuckle-opener arm or finger 3^e of the member E bears against the wall of the coupler-head and prevents such member E from being rotated out of supporting engagement with said lock. If the knuckle B be now subsequently opened by the separation of the cars or in other manner, the trip-finger 2^e of member E will be engaged by the inclined trip projection 2^b upon the upper surface of the knuckle-tail, and the detent-finger 1^e will be rotated out of supporting engagement with the notch 3^d of the lock D, the latter being dropped upon the lock-supporting shelf 5^b of the knuckle, which at this time has passed beneath the lower end of the body portion of the lock. During this opening movement of the knuckle the knuckle-opener finger 3^e moves down the incline of the abutment 1^a of the coupler-head, being permitted to do so by the enlarged slot at the upper end of member E, and thus the attendant rising of the lock D is decreased. The knuckle B now being open and the lock D seated upon the lock-supporting shelf 5^b, a closing movement of the knuckle will cause the rear incline of the trip projection 2^b to engage the trip-finger 2^e of member E and to raise it slightly until such trip projection 2^b of the knuckle has passed under, when the knuckle-opener finger 3^e is forced onto its seat or abutment 1^a and the trip-finger 2^e returns to a position between such trip projection of the knuckle and the lock D, and the parts are in locked or normal position, as shown in Fig. 3. If the knuckle B is free to open when the detent-finger 1^e engages the notch 3^d of the lock D, as heretofore described, a continued upward pull upon the lock D will cause the projecting ear or lug 2^d thereof to rotate the member E through the agency of the detent lug or finger 1^e, and consequently will cause the knuckle-opener finger 3^e to rotate the knuckle outward, so that by thus lifting the lock the knuckle may be fully opened, as shown in Fig. 5. The upward pull being now released, the lock will seat itself upon the lock-supporting shelf 5^b of the knuckle and will be retained thereon until the knuckle is returned to a locked position, which occurs in the same manner as heretofore described. Should it be desired to return the lock D to a locked position after it has been brought to an unlocked position and before it has been released from the supporting engagement of the lock-set member E by the opening movement of the knuckle, the same may be accomplished by an upward movement of the cam-slide or lock-set release member *d*, causing the lower portion 6^d thereof to force the detent-finger 1^e of the said lock-set member E out of

supporting engagement withsaid lock. Whenever the lock has been returned to a locked position, the continued downward movement of the member F causes its lower end to be projected under a shoulder on the coupler-head, and by reason of the inclination of the slots or notches 5^d, with which the bosses or pins 1^f engage, any tendency to an upward movement of the lock D causes such member F to more surely engage the coupler-head, and thereby to prevent any accidental unlocking movement of the lock. Should the coupler be pulled out of its connections with the car, the pull of the uncoupling-chain upon the clevis G first causes the retraction of the lower end of the member F from beneath the shoulder of the coupler-head, with which it engages. The lock D is then raised to unlocked position and the knuckle opened as the coupler is pulled forward, the member F emerging through the bifurcating slot 4^d in the rear of the lock and sliding over the inner edge of the lock-opening in the upper wall of the coupler-head in such manner as to have a shifting fulcrum thereon, the curved character of the emergency releaser member F permitting the lock to be easily brought to an unlocked position as the coupler is pulled forward relatively to the car-body.

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, a lock for said knuckle, a lock-set and knuckle-opener member having a detent-finger arranged out of the path of movement of the lock when the latter is in locked position and adapted to move into engagement with and to retain said lock in unlocked position when the knuckle is in locked position, and means whereby said lock is released from said lock-set and knuckle-opener member upon the opening movement of said knuckle, substantially as and for the purposes specified.

2. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, and a member having a trip-finger and a detent-finger thereon, said detent-finger arranged out of the path of movement of the lock when the latter is in locked position and adapted to move into supporting engagement with said lock and said trip-finger adapted to coact with said knuckle upon an opening movement of the latter to release said lock from said detent-finger, substantially as and for the purposes specified.

3. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, and a member having a trip-finger, a detent-finger and a knuckle-opener arm, said detent-finger arranged out of the path of movement of the lock when the latter is in locked position and adapted to move into supporting engagement with said lock, said trip-finger adapted to coact with said knuckle upon an opening movement of the latter to release said lock from said detent-finger, and said knuckle-opener arm adapted to coact with said detent-finger to open said knuckle, substantially as and for the purposes specified.

4. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, a member loosely mounted in the coupler-head and adapted to move into supporting engagement with said lock, and a projection upon the tail of said knuckle adapted to disengage said loosely-mounted member from supporting engagement with said lock upon an opening movement of said knuckle, substantially as and for the purposes specified.

5. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, and a lock-set and knuckle-opener member having a detent-finger arranged out of the path of movement of the lock when the latter is in locked position and adapted to move into supporting engagement with said lock and to be disengaged from said lock upon an opening movement of said knuckle, substantially as and for the purposes specified.

6. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, and a lock-set and knuckle-opener member adapted to move into supporting engagement with said lock and to have a movement in any direction in the plane of its operation, substantially as and for the purposes specified.

7. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, and a lock-set and knuckle-opener member having a pin-and-slot connection with said coupler-head adapted to permit movement of said lock-set and knuckle-opener member in any direction in the plane of its operation, substantially as and for the purposes specified.

8. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, and a knuckle-opener member adapted to move into engagement with said lock and to have a movement in any direction in the plane of its operation, substantially as and for the purposes specified.

9. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, and a knuckle-opener member having a pin-and-slot connection with said coupler-head adapted to permit movement of said knuckle-opener member in any direction in the plane of its operation, substantially as and the purposes specified.

10. In a car-coupler, the combination with a knuckle, of a lock for said knuckle, and a lock-set member adapted to move into supporting engagement with said lock and to have a movement in any direction in the plane of its operation, substantially as and for the purposes specified.

11. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, and a lock-set member adapted to move into supporting engagement with said lock and having a pin-and-slot connection with said coupler-head adapted to permit movement of said lock-set member in any direction in the plane of its operation, substantially as and for the purposes specified.

12. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, and a lock-set member, said last-named member having a trip-finger, a detent-finger and means adapted to form a pin-and-slot connection with the coupler-head whereby said lock-set member may have movement in any direction in the plane of its operation, substantially as and for the purposes specified.

13. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, a lock-set and knuckle-opener member having a detent-finger arranged out of the path of movement of the lock when the latter is in locked position and adapted to move into supporting engagement with said lock, and means independent of said lock-set and knuckle-opener member for releasing said lock from such supporting engagement, substantially as and for the purposes specified.

14. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, a lock-set and knuckle-opener member having a detent-finger arranged out of the path of movement of the lock when the latter is in locked position and adapted to move into engagement with and to retain said lock in unlocked position when the knuckle is in locked position, means whereby said lock is released from said lock-set and knuckle-opener member upon the opening movement of said knuckle, and means whereby said lock may be released from said lock-set and knuckle-opener member independently of the movement of said knuckle, substantially as and for the purposes specified.

15. A knuckle for vertical-plane car-couplers, said knuckle having a projection on the upper surface of the tail thereof and a substantially wedge-shaped shelf beyond the same, substantially as and for the purposes specified.

16. A knuckle for vertical-plane car-couplers, said knuckle having a knuckle-pin hole, an inclined projection on the upper surface of the tail thereof, and a shelf having its outer border eccentric to the knuckle-pin hole, substantially as and for the purposes specified.

17. A knuckle for vertical-plane car-couplers, said knuckle having a knuckle-pin hole, a projection upon the upper surface of the tail thereof, a hook portion, and a locking-face extending a greater distance radially from the knuckle-pin hole than does said hook portion, substantially as and for the purposes specified.

18. A knuckle for vertical-plane car-couplers, said knuckle having a projection upon the upper portion of the tail thereof and a shelf beyond the same, substantially as and for the purposes specified.

19. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, and emergency releaser means comprising a curved lever having pintles adapted to engage said lock, substantially as and for the purposes specified.

20. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle having a bifurcating channel therein, and a curved lever housed within said channel and provided with pintles adapted to engage said lock, substantially as and for the purposes specified.

21. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, and emergency releaser means adapted to engage a portion of the coupler-head to prevent accidental unlocking of said lock, substantially as and for the purposes specified.

22. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, and an emergency releaser-lever adapted to pivotally engage said lock within the coupler-head and to engage a portion of the coupler-head to prevent accidental unlocking of said lock, substantially as and for the purposes specified.

23. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle having a bifurcating channel and provided with inclined guideways, and a curved lever housed within said channel and provided with means for engaging the inclined guideways of said lock, substantially as and for the purposes specified.

24. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle having a bifurcating channel and provided with inclined guideways, and a curved lever housed within said channel and provided with pintles adapted to engage the inclined guideways of said lock within the coupler-head, substantially as and for the purposes specified.

25. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, a lock-set member adapted to move into supporting engagement with said lock, and means housed within said lock for releasing the latter from such supporting engagement of said lock-set member, substantially as and for the purposes specified.

26. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, a lock-set member adapted to move into engagement with and to retain said lock in unlocked position when the knuckle is in locked position, means whereby said lock is released from said lock-set member upon the opening movement of said knuckle, and means

housed within said lock for releasing the latter from said lock-set member independently of the movement of said knuckle, substantially as and for the purposes specified.

27. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, a lock-set member adapted to supportingly engage said lock, and a cam-slide for releasing said lock from such supporting engagement of said lock-set member, substantially as and for the purposes specified.

28. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, a lock-set member adapted to supportingly engage said lock, and a cam-slide housed within said lock for releasing the latter from such supporting engagement of said lock-set member, substantially as and for the purposes specified.

29. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle provided with a pocket adapted to receive a lock-set member and with a slot communicating with said pocket, a lock-set member, and a cam-slide within the said slot adapted to engage said lock-set member, substantially as and for the purposes specified.

30. A lock for vertical-plane car-couplers, said lock provided with a channel and with inclined guideways adapted to receive an emergency releaser member, substantially as and for the purposes specified.

31. A lock for vertical-plane car-couplers, said lock provided with a pocket adapted to receive a lock-set member and with a slot communicating with said pocket, said slot being adapted to receive a lock-set release member, substantially as and for the purposes specified.

32. A lock for vertical-plane car-couplers, said lock provided with means adapted to pivotally engage an emergency releaser-lever and with a bifurcating channel adapted to receive such emergency releaser-lever, substantially as and for the purposes specified.

33. A knuckle for vertical-plane couplers having a knuckle-pin hole, a projection upon the upper surface of the tail thereof, and a projecting locking-face of washer form adapted to stand back of a portion of the locking-pin when in a locked position, substantially as and for the purposes specified.

In testimony whereof I affix my signature, in presence of two witnesses, this 6th day of October, 1904.

WILLIAM McCONWAY, Jr.

Witnesses:
Samuel L. Duff,
Geo. W. McCandless.