

E. P. KINNE.
CAR COUPLING.
APPLICATION FILED OCT. 27, 1908.

1,009,419.

Patented Nov. 21, 1911.

3 SHEETS-SHEET 1.

Fig. 2

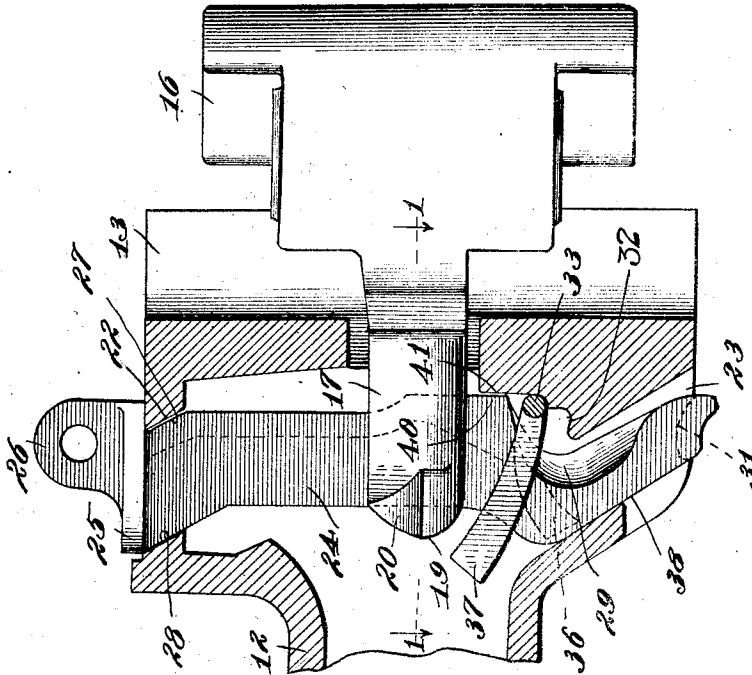
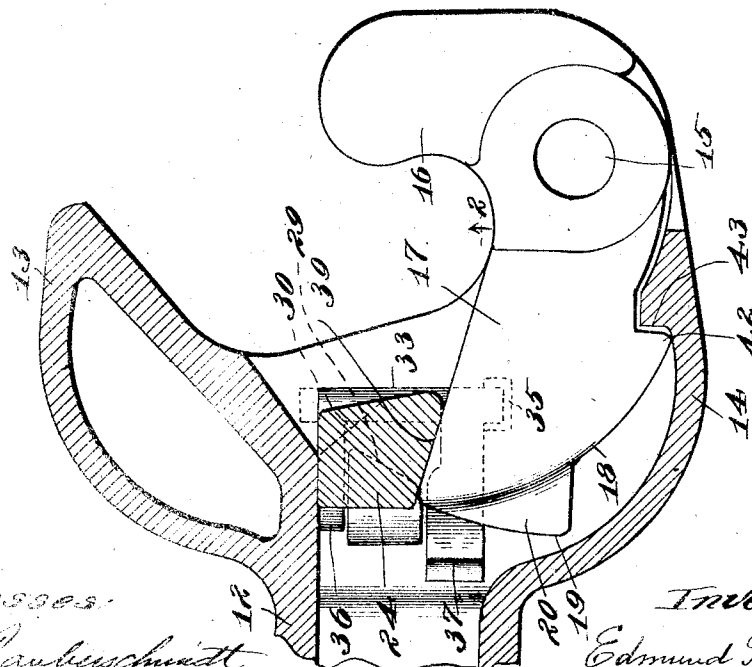


Fig. 1



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Inventor:

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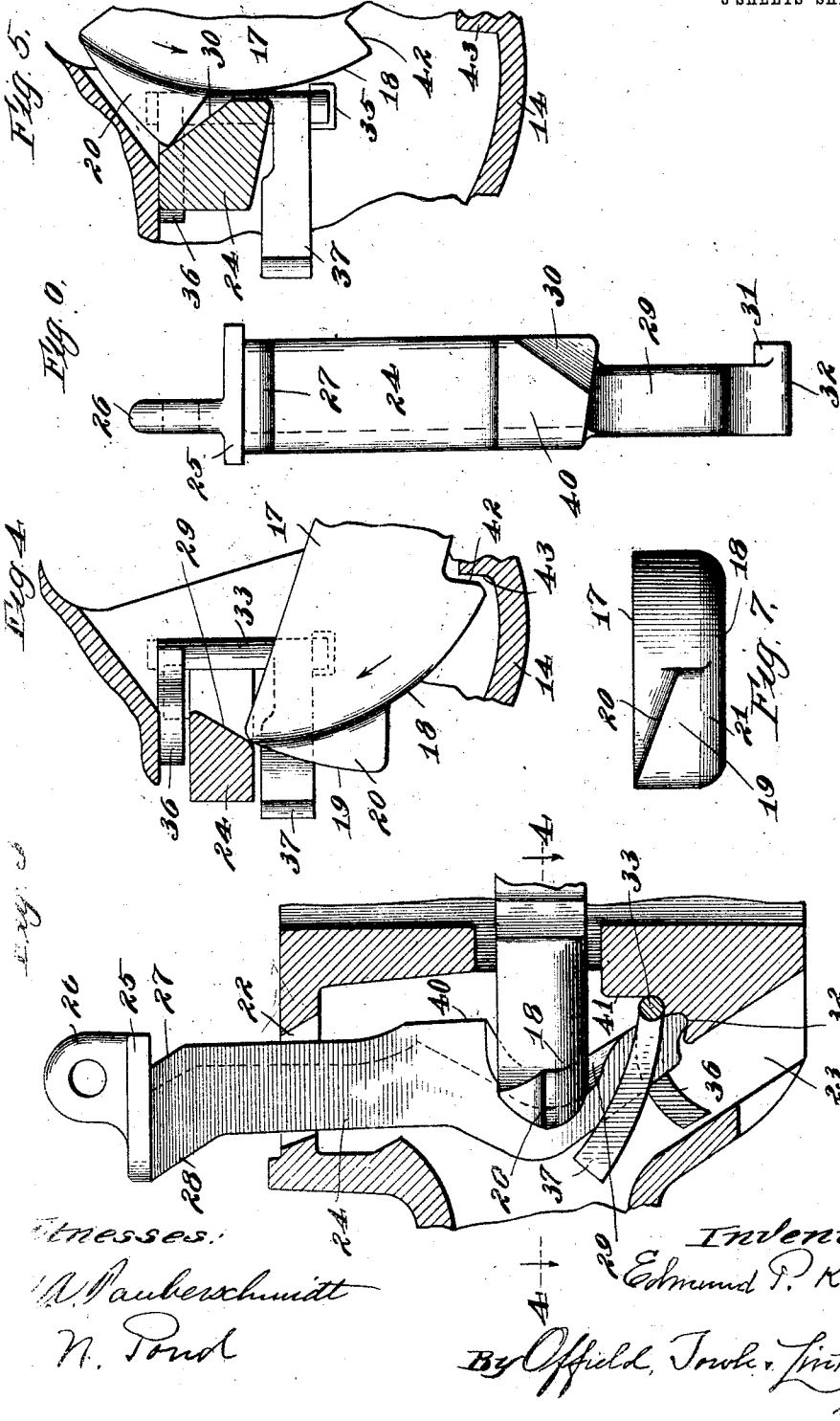
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3 SHEETS-SHEET 2.



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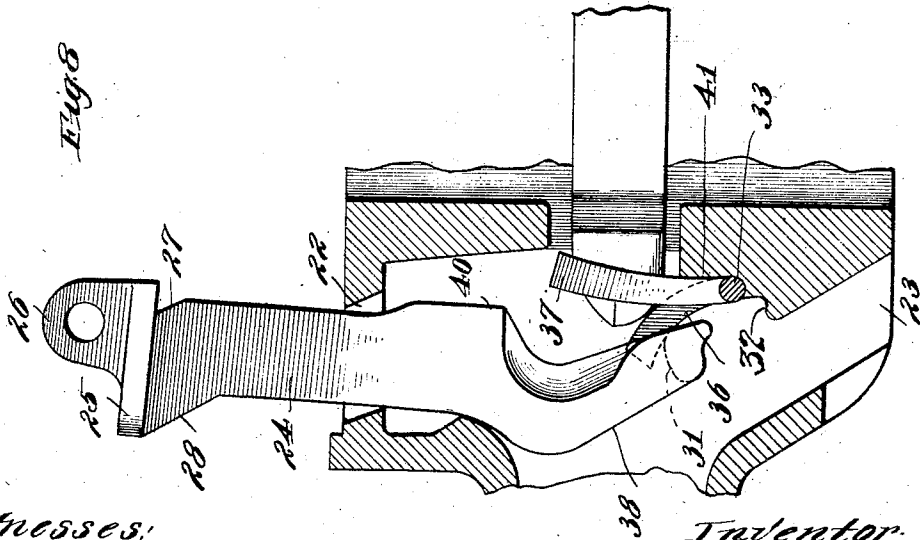
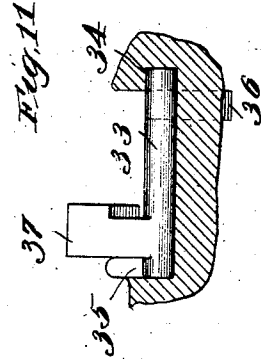
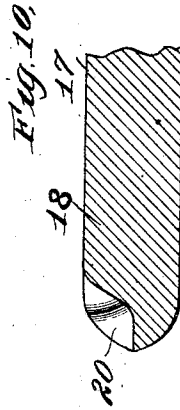
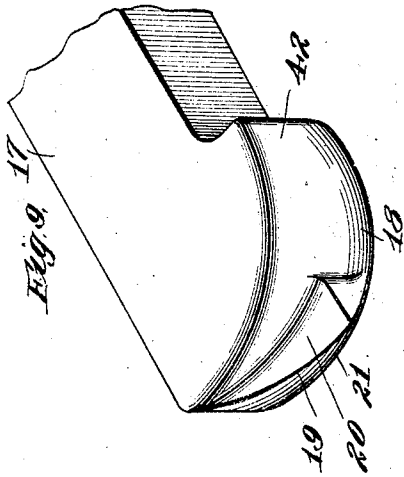
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3 SHEETS-SHEET 3.



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UNITED STATES PATENT OFFICE.

EDMUND P. KINNE, OF ALLIANCE, OHIO, ASSIGNOR TO AMERICAN STEEL FOUNDRIES,
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CAR-COUPLING.

1,009,419.

Specification of Letters Patent. Patented Nov. 21, 1911.

Application filed October 27, 1908. Serial No. 459,771.

To all whom it may concern:

Be it known that I, EDMUND P. KINNE, a citizen of the United States, residing at Alliance, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Car-Couplings, of which the following is a specification.

This invention relates to couplers of the Janney type, and more especially to that class employing a vertically movable locking pin for securing and releasing the knuckle at the proper times, with a device actuated by the locking pin in its rising movement to throw the knuckle into open position.

The principal objects of my invention are, first, in general, to provide an improved coupler of this character; second, to provide a coupler in which the full opening movement of the knuckle is insured by the rise of the locking pin; and, third, to render the opening of the knuckle more easy and certain in operation. These objects I attain chiefly through the provision of a novel form and arrangement of knuckle-opening device characterized chiefly by its location relatively to and its manner of engagement with the tail of the knuckle. Heretofore such devices have been so located as to lie opposite the back of the tail of the knuckle and exert thereon an initial push or kick when the locking pin is raised. My improved knuckle-opening device is located opposite the inner end of the tail of the knuckle, operates in a direction parallel with instead of transversely to the longitudinal axis of the coupler, and continuously engages the cam-shaped end of the tail of the knuckle throughout the entire opening movement of the latter and at an advantageous leverage.

My invention and the advantages secured thereby will be more fully understood by reference to the accompanying drawings, which illustrate one practical mechanical embodiment thereof, and in which,—

Figure 1 is a horizontal section through the coupler head and its contained parts, on the line 1—1 of Fig. 2, with the knuckle shown in top plan view and in locked position. Fig. 2 is a vertical longitudinal section through the coupler head, on the line 2—2 of Fig. 1, with the locking pin and knuckle appearing in elevation, the latter being shown in locked position. Fig. 3 is

an abbreviated view similar to Fig. 2, showing the locking pin in lock-set position. Fig. 4 is a horizontal sectional detail on the line 4—4 of Fig. 3. Fig. 5 is a detail similar to Fig. 4, but showing the tail of the knuckle thrown to its outermost or open position. Fig. 6 is a detail front elevation of the locking pin. Fig. 7 is a detail end elevation of the tail of the knuckle. Fig. 8 is a view similar to Fig. 3, but showing the fully raised position of the locking pin, and illustrating the manner of actuating the knuckle in its opening movement from the locking pin through the agency of the interposed "kicker." Fig. 9 is a perspective view of the inner end of the tail of the knuckle, more especially illustrating a cam carried thereby through which the locking pin is raised out of the way during the closing movement of the knuckle. Fig. 10 is a fragmentary longitudinal section through Fig. 9. Fig. 11 is a transverse sectional detail in the plane of the axis or shaft of the "kicker", illustrating the manner of mounting the same.

Referring to the drawings, 12 designates the shank, 13 the guard arm, and 14 the knuckle-carrying member of a car coupler of the Janney type. On a pivot-bolt carried by the member 14 is pivoted the knuckle 16 which has, in this case, an inwardly extending tail 17 formed with a rounded cam-shaped inner end 18 of peculiar configuration. This rounded end of the tail of the knuckle has formed thereon an inwardly projecting extension 19 of generally triangular form in plan view, the upper surface 20 of which is inclined, as well shown in the detail view Fig. 7, and constitutes a cam to effect the automatic lifting of the locking pin out of the way when the knuckle closes. The lower surface 21 of the extension 19 is tapered off downwardly and inwardly of the tail-piece, so as to merge into and constitute a continuation of the lower upwardly and inwardly tapered edge of the cam end 18.

The top and bottom walls of the coupler head are provided with apertures 22 and 23, respectively, the front and rear walls of which are inclined downwardly and forwardly of the head, for the accommodation of the locking pin designated as an entirety by 24. This locking pin has at its upper end a horizontal flange 25 by which it rests

on the top of the coupler head when in its lowermost position, and above the same an apertured lug or eye 26 for connection of the usual lifting chain (not shown). The upper end of the shank of the locking pin directly beneath the flange 25 is laterally and rearwardly offset, being formed with oblique front and rear sides 27 and 28 adapted to cooperate with the correspondingly inclined walls of the aperture 22. The locking pin is further provided, near its lower end, with a transverse notch or recess 29 formed in its front face to admit the passage past the same of the tail of the knuckle when the pin is in lock-set position, so as to permit the knuckle to yield and open when the cars are drawn apart, the bottom wall of the recess having a transverse inclination or pitch corresponding substantially to the inclination of the outer edge of the extension 19, as best illustrated in Fig. 4. The shank of the locking pin directly above the notch 29 is formed with an oblique inclined or cam surface 30, which is adapted to be engaged by the inclined surface 20 of the extension 19 of the knuckle tail when the knuckle is swung inwardly to automatically raise the locking pin out of the way and permit the knuckle to close. The lower end of the locking pin has a laterally projecting toe 31 which, when the pin is raised from its lowermost or locking position, cooperates with one arm of a knuckle-opening device to cause the pin to assume the lock-set position, and, when the pin is further raised, actuates said device to cause the latter to push the tail of the knuckle outwardly, thus opening the knuckle.

The coupler head has formed on its inner front wall directly above the lower aperture 23 a lock-set shoulder or seat 32, on which the lower end of the locking pin rests when in lock-set position, and just above said shoulder is journaled the rock-shaft 33 of the knuckle ejector or "kicker." Fig. 11 illustrates the manner of mounting the shaft 33, from which it will be seen that a whole bearing 34 and a half bearing 35 are provided for the opposite ends of the shaft, so that the shaft may be seated by first introducing one end thereof to the whole bearing 34, and then permitting the opposite end to drop into the half bearing 35. On the shaft 33 which, it will be observed, is mounted to lie horizontally in a direction at right angles to the longitudinal axis of the coupler head, are a pair of downwardly and upwardly curved arms 36 and 37, respectively, both projecting rearwardly of the coupler head. The arm 36 lies above and in the vertical plane of the laterally projecting toe 31 of the locking pin, so that its concave lower edge is adapted to be engaged by said toe when the pin is raised, whereby the lower end of the pin is guided to its seat on the

ledge 32, thus causing the pin to assume the lock-set position. The arm 37, which projects from near the opposite end of the shaft 33, lies below and behind the rounded cam-shaped end of the knuckle-tail, and is so positioned that, when raised, it engages said rounded end of the knuckle tail at the point thereof most remote from the pivot 15.

Referring once more to the locking pin, it will be observed that the rear side thereof at its lower end is formed on an incline, as indicated at 38, corresponding to the inclination of the inner or rear wall of the lower opening 23, so that, as the pin drops to its lowermost or locking position, the said inclined walls cooperate to urge the pin forwardly of the coupler head, the similar inclines on the rear side of the offset upper end portion of the pin and on the rear wall of the upper opening 22 having the same effect upon the upper end of the pin. This forward tendency of the locking pin is augmented by the angular engagement of the knuckle tail and side of the locking pin as indicated at 39. In this manner upward creeping of the pin is avoided. When the locking pin is in its lowest position, however, as shown in Fig. 2, the front portion 40 of the pin contacts with the portion 41 of the coupler head, and prevents the wedging action of the two locking faces from forcing the locking pin forward of its proper position.

On the back of the knuckle tail 17 there is formed a laterally extending lug 42 which engages a shoulder or stop 43 in the coupler head and assists in relieving strain on the pivot-pin 15 of the knuckle. This feature, in cooperation with the inclined engagement of the adjacent-sides of the locking pin and knuckle tail, as shown at 39, also prevents the knuckle from being pulled out in case the pivot-pin breaks.

In assembling the parts, the knuckle-ejector must first be inserted, then the locking pin, and finally the knuckle. The knuckle-ejector having first been inserted by entering one end of the shaft 33 in the whole bearing 34 and dropping the opposite end into the half bearing 35, the locking pin is then inserted by rotating the ejector upward or outward as far as possible to permit the toe of the locking pin to pass the arm 36, for which purpose the ejector is turned to a position slightly beyond that indicated in Fig. 8 (the knuckle not being present). The ejector is then turned back so that the two arms lie one on each side of the locking pin, and the knuckle is then pivoted in place.

In the operation of the device, if it is desired to simply raise the locking pin to lock-set position in order to permit the knuckle to open, as in uncoupling two cars, the locking pin is raised by the usual means

until the toe thereof engages the concave lower edge of the arm 36, by which it is guided onto the seat 32. This brings the notch 29 into the horizontal plane of the tail of the knuckle, as shown in Fig. 4, so that the knuckle can swing freely to open position. If it is desired to positively open the knuckle, as in preparation for coupling, the pin is raised still higher, and the sliding engagement of the toe 31 on the arm 36 rocks the ejector, causing the arm 37 to strike the extreme outer end of the knuckle tail at the remote end of the continuous cam curve formed on the lower edge 21 thereof. The involute character of this curve is such that the pressure of the arm 37 thereon acts to push the tail of the knuckle outwardly, thus opening the knuckle; and it will be observed as constituting an important feature of the invention that this action of the arm 37 on the knuckle tail is continuous throughout the entire outer or opening movement of the knuckle, the arm operating always in a direction parallel with the longitudinal axis of the coupler. In other words, the action is that of a continuous thrust upon a cam surface, rather than a mere momentary push or kick to effect the initial part of the opening movement of the knuckle, as heretofore. The closing of the knuckle and its automatic locking may be effected when the locking pin is in its seated position by reason of the engagement of the cooperating incline or cam surfaces 20 and 30 of the knuckle tail and locking pin, respectively, which act to raise the pin sufficiently to permit the knuckle tail to pass thereby, after which the pin drops by gravity into the locking position, being urged forwardly by the cooperating inclined walls of the upper and lower ends of the pin and the apertures of the coupler head through which it passes. From the above it will be seen that my invention provides a device wherein the knuckle is positively forced to open position by a continuous thrust upon the tail of the knuckle when the locking pin is fully raised, and by which also the locking pin is prevented from creeping under pull upon the knuckle by reason of the constant tendency to draw the locking pin forwardly to

a position into which it cannot rise since, owing to the relative formation of the upper and lower ends of the locking pin and the apertures through which it passes, the pin must move bodily backward of its normal locking position before it can rise. The anti-creeping capacity is thus secured by the relative formation of the locking pin, coupler head, and knuckle tail, without requiring the employment of an additional device or devices for this purpose.

I claim:

1. The combination with a coupler head, of a knuckle pivoted therein and having a tail provided with a cam-shaped inner end, of a locking pin movable vertically across the path of said knuckle tail, a knuckle-opening device comprising a rock-shaft pivoted in said coupler head on an axis transverse to the longitudinal axis of the coupler head and a pair of inwardly extending arms rigid with said rock-shaft, one of which arms is adapted to engage said cam-shaped end of the knuckle tail throughout the entire opening movement of the knuckle, and a lateral projection on said locking pin adapted, when the latter is raised, to engage and lift the other of said arms whereby to rock said knuckle-opening device and cause said first-named arm to force said knuckle tail outwardly of the coupler head, substantially as described.

2. The combination with a coupler head, of a knuckle pivoted therein and having a tail provided with a cam-shaped inner end, of a locking pin movable vertically across the path of said knuckle tail, a knuckle operating device pivoted in said coupler head on an axis located in front of the locking pin, and having a portion adapted to slidably engage said cam-shaped end of the knuckle tail to open the knuckle, and means carried by the locking pin adapted when the latter is raised to rock said knuckle opening device into engagement with said knuckle tail, substantially as described.

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Witnesses:

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