(No Model.) 3 Sheets—Sheet 1.

C. A. TOWER.

CAR COUPLING.

No. 487,650. Patented Dec. 6, 1892.

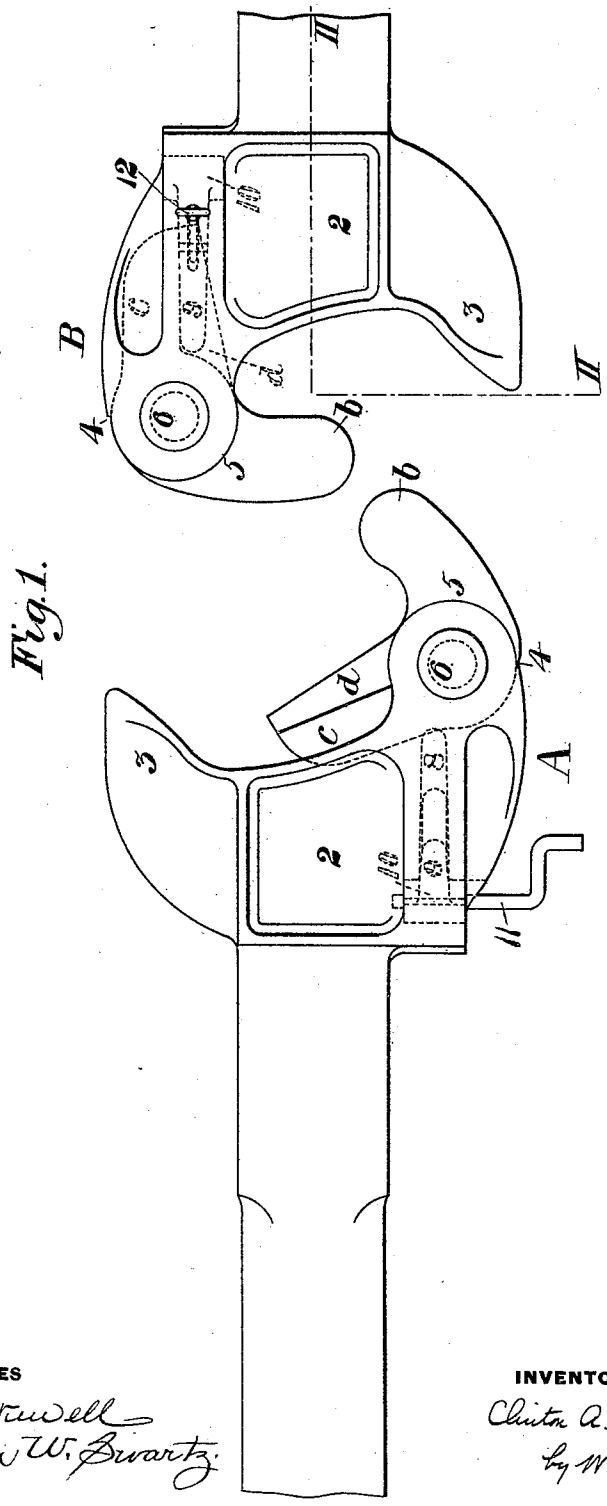

Fig. 1.

WITNESSES

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(No Model.) 3 Sheets—Sheet 2.

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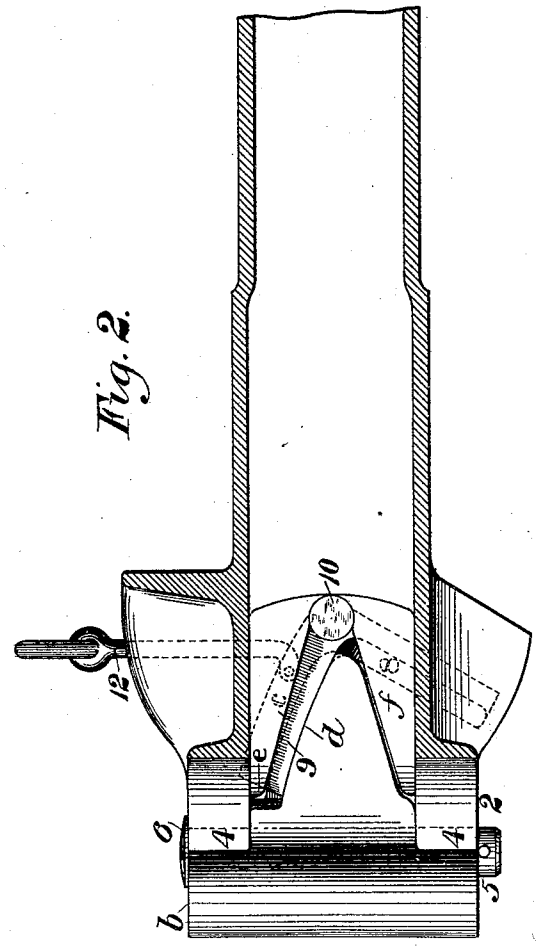
Fig. 2.



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3 Sheets—Sheet 3.

C. A. TOWER.

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Fig. 3.

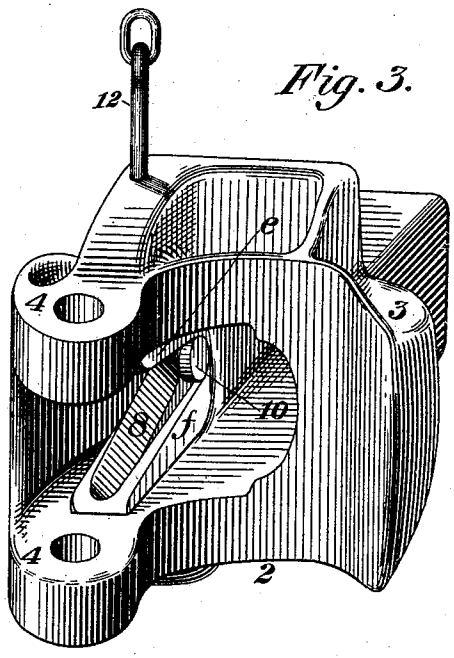


Fig. 4.

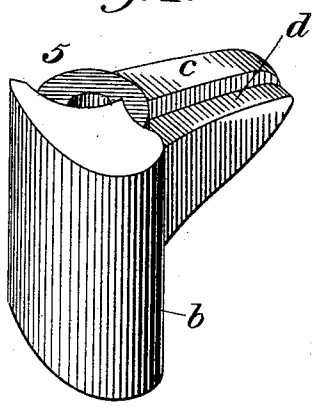
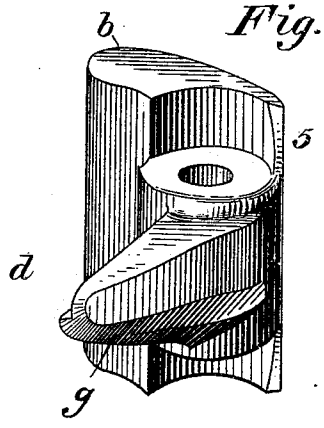


Fig. 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

CLINTON A. TOWER, OF CLEVELAND, OHIO.

CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 487,650, dated December 6, 1892.

Application filed November 2, 1892. Serial No. 450,755. (No model.)

To all whom it may concern:

Be it known that I, CLINTON A. TOWER, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Car-Couplers, of which the following is a specification.

In the accompanying drawings, Figure 1 is a plan view showing two coupler-heads A B constructed in accordance with my invention and situate in the positions which they occupy when about to be coupled together. Fig. 2 is a vertical longitudinal section of the coupler on the line II II of Fig. 1. Fig. 3 is a perspective view of the interior of the coupling-head, illustrating the locking and opening fingers. Figs. 4 and 5 are perspective views of the knuckle.

My invention relates to that class of car-couplers in which the coupling-head is provided with a swinging coupling-knuckle adapted to engage a similar knuckle in the coupling-head of an opposite car; and its purpose is to provide improved means by which the knuckles can be locked in engagement with each other and by which after unlocking they can be moved open into position for recoupling without making it necessary for the brakeman to go between the cars.

My invention is an improvement upon the car-coupling mechanism shown in a prior application, Serial No. 450,639, filed by me on November 1, 1892; and it consists principally in the following items of invention: first, in an improvement in which the locking and opening fingers are arranged to move radially in a vertical plane instead of moving in straight lines vertically; second, in combining the locking and opening fingers in a rocking device of general **U** form or **V** form having the pivotal axis at the apex or juncture of the two fingers; third, in a coupling-knuckle provided with a holding-arm having on its rear lower edge a beveled bearing-surface extending from its outer end to or nearly to its axis, assuming a spiral form increasing toward the axis and adapted to be engaged by the opening-arm, acting thereon in the manner of a wedge. The third item of invention relates to a coupling-knuckle which may be employed in other combinations.

In the drawings, 2 represents the draw-head of the coupler, which in general may be of common type and outline, having two jaws 3 4, the jaw 4 being laterally recessed or forked and containing a knuckle 5, which may be pivoted in the usual manner by a pin 6, passing through it and through registering holes in the coupler-head. The knuckle has an outer arm *b* and an inner and preferably-longer arm *c*, which when the coupler is locked, as shown at B in Fig. 1, rests in the cavity of the jaw 4. For the purpose of holding the knuckle in locked position (the position shown at B in Fig. 1) I employ a pivoted vertically-rocking device having a projection or finger 9, which is adapted to engage and hold the knuckle-arm *c*, and having a second finger 8, which when the rocking device is retracted from locking position engages the said arm and opens the knuckle.

My improved coupler, as shown in the drawings, therefore has means for locking the knuckle and for opening it. Both these means are of new construction, and therefore in this specification I claim the coupler not only when it is constructed, as shown in the drawings, with devices for locking and opening it, but I intend also to cover the same even when used without the opening mechanism. The locking and opening devices are made the subject of separate claims herein, each unlimited by peculiar qualifications contained in the other.

The rocking device shown in the drawings is of **V** form or **U** form, having its two arms 8 9 diverging from a middle point, at which point the device is provided with lateral trunnions 10 or other means enabling it to be pivoted in the coupler-head. It is pivoted on the axis of these trunnions at the rear part of the jaw 4, and when set in position the fingers project forwardly toward the axis 6 of the coupling-knuckle and fit in vertical guide-boxes *e f*, formed in the top and bottom plates of the coupler-head. It can be rocked upon its trunnions, so as to cause the fingers to move vertically in either direction, by suitable means, such as a crank-shaft 11, which projects through the side of the draw-head and is keyed or otherwise secured to one of the trunnions, or by a lifting link or links 12, extending vertically through a hole in the top

(or bottom) of the draw-head and secured to one of the fingers. The shaft 11 and link may be connected to the usual cross-shaft, which is journaled at the end of the car and operated by a rotary motion in the case of the crank 11 or by a vertical lift in the case of the link 12. When the knuckle is adjusted in the coupler-head, its arm *c*, when in locked position, fits between the fingers 8 9, which then extend lengthwise of this knuckle-arm below and above the same, respectively. The top of the knuckle-arm is formed with a longitudinal recess or seat *d* upon its face, adapted to receive the locking-finger 9, which when the knuckle is swung back to locked position extends lengthwise of the arm *c* and drops by gravity upon said seat. When the parts are in this position, the locking-finger is partly in the vertical guide-box in the top of the coupler-head and partly on the seat *d* and the knuckle is locked; but if the rocking device be raised on its pivot the finger 9 will be lifted in its box above the knuckle-arm, and it thus will free the latter and permit it to move open. When moved open, the arm *c* passes under and upholds the finger 9, the prolongation of the finger toward the axis 6 causing it to be supported until the knuckle is swung back into locked position and the seat *d* restored to its position directly beneath the finger, which thereupon drops in front of the knuckle-arm and by reason of its long bearing holds the knuckle firmly.

The lower finger 8 may be formed with a beveled front upper edge and is situate below the knuckle-arm *c*, which is tapered in form from its axis outwardly and is provided on the lower edge of its rear side (the side next the jaw 4 of the coupler-head) with a beveled bearing-surface *g*, extending nearly to the knuckle's axis. The finger is so directed that when it is moved vertically on its axis it will engage the rear edge of said arm and by acting thereon in the manner of a wedge will open the knuckle. The pivotal point of the fingers 8 9 is set at the outer end of the knuckle-arm, so that the first engagement of the finger 8 therewith shall be at this point, thus affording a long leverage to the finger and making it easy to start the knuckle in case it should stick. As the knuckle-arm moves open the place of the bearing of the finger 8 on its beveled edge correspondingly approaches the axis 6, and by reason of the continued bearing thereon the knuckle is opened to a wide extent, as at A in Fig. 1. The opening action of the finger 8 thus continues throughout the axial motion of the knuckle and not only starts the knuckle open, but opens it to its full extent or to such extent as to permit ready coupling. To secure this action, the finger 8 should extend lengthwise of the knuckle-arm when the latter is in locked position, though it need not be exactly parallel therewith. In order to compensate for the diminished leverage as the bearing of the finger 8 approaches the axis, the bevel *g* on the knuckle-arm is made of spiral form, the pitch of the spiral increasing from the outer end toward the axis.

It results from the construction above explained that when the knuckle is locked, as shown at B in Fig. 1, if the fingers 8 9 be turned on their axis, so as to move vertically upward, the first action will be to release the finger 9 from its seat *d*, thus unlocking the knuckle, and next the finger 8 will engage the outer end of the arm *c*, and, acting on the rear side of said arm, will progressively move it open. When the knuckle has been opened and the finger released, the locking-finger is supported by the knuckle, as above explained.

The fingers 8 and 9 are separated from each other by an intermediate space of sufficient size that the upper finger 9 shall leave and free the knuckle-arm and shall move upwardly therefrom a considerable distance (preferably about three-quarters of an inch, though it may be as small as one-quarter of an inch) before the lower finger 8 engages its beveled bearing-surface on the knuckle-arm. This affords an intermission between the operation of unlocking and the beginning of opening of the knuckle, during which intermission the fingers have loose motion or play. This is preferable, for it enables the operator of the device in raising the fingers to feel the contact of the parts at the beginning of the knuckle-throwing operation, and thus to determine that the locking-finger is quite out of contact with the knuckle and that the latter is free to be opened. The intermediate loose play furnishes means by which on raising the fingers sharply a blow of considerable impetus can be given to the knuckle to dislodge it in case it should not move freely in the coupler-head, and in any case it renders the operation of opening the knuckle easier.

The advantages of the invention will be appreciated by those skilled in the art.

The coupling-knuckle, formed as stated in the claims, can be locked and opened better than prior constructions, and the pivoted arrangement of the locking and opening fingers affords important benefits.

I claim—

1. In a car-coupler, the combination, with a swinging knuckle, of a locking-finger pivoted to move radially in a vertical plane within a recess or box in the coupler-head, said finger extending lengthwise of the knuckle-arm when locked and adapted to have a locking-bearing thereon, substantially as and for the purposes described.

2. In a car-coupler, the combination, with a pivoted knuckle, of a locking-finger pivoted to move radially in a vertical plane, said finger having a bearing on the knuckle-arm near its axis and adapted to be supported thereby when the knuckle is opened and being adapted to move automatically into engagement

with the knuckle-arm and to lock the same when closed, substantially as and for the purposes described.

3. In a car-coupler, the combination of a swinging knuckle and an opening-finger pivoted at the outer end of and extending lengthwise of the inner knuckle-arm when locked and adapted to move radially in a vertical plane and to engage the arm and open it, substantially as and for the purposes described.

4. In a car-coupler, the combination of a swinging knuckle and a finger or fingers extending lengthwise of the knuckle-arm when locked, pivoted to move radially in a vertical plane in a box in the coupler-head, and adapted when moved in one direction to engage the arm and to hold it and when moved in the other direction adapted to engage the arm to open it and when released to be upheld thereby, substantially as and for the purposes described.

5. In a car-coupler, the combination of a swinging knuckle and two connected fingers pivoted in the coupler-head and radially movable on said pivot in a vertical plane, one of said fingers being above and the other below the knuckle-arm, one of said fingers being adapted when moved in one direction in a recess or box to engage the arm to hold it and the other finger being adapted when moved in the other direction to engage the arm and open the knuckle, substantially as and for the purposes described.

6. A swinging knuckle for car-couplers, having its rear arm provided on its rear face with a beveled bearing-surface extending from its outer end to or nearly to its axis and adapted to be engaged by an opening device, the bevel of said bearing-surface being of spiral form, increasing toward the axis, substantially as and for the purposes described.

7. A coupler-head having interiorly-projecting vertical boxes, a coupling-knuckle whose rear arm fits between the boxes, and locking and opening fingers extending lengthwise of the knuckle-arm when locked and situate in the upper and lower boxes, respectively, substantially as described.

In testimony whereof I have hereunto set my hand this 25th day of October, A. D. 1892.

CLINTON A. TOWER.

Witnesses:

JOHN H. BAEHR,

EMIL W. JAITE.