C. A. TOWER.

CAR COUPLING.

APPLICATION FILED APR. 16, 1907.

999,915.

Patented Aug. 8, 1911.

4 SHEETS—SHEET 1.

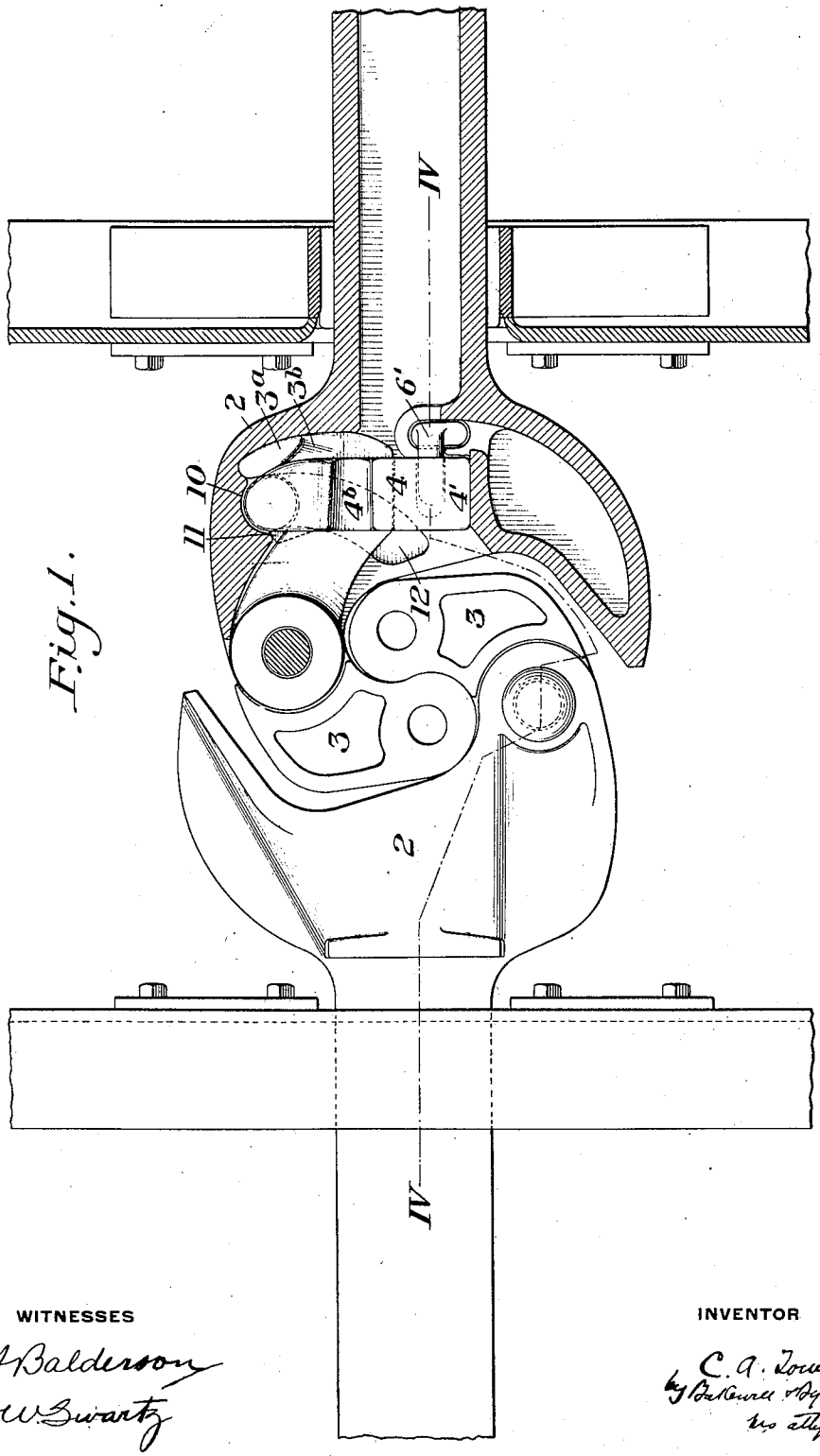

Fig. 1.

WITNESSES

R. A. Balderson

W. W. Swartz

INVENTOR

C. A. Tower

by Baldwin & Agnew

his attys

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4 SHEETS—SHEET 2.

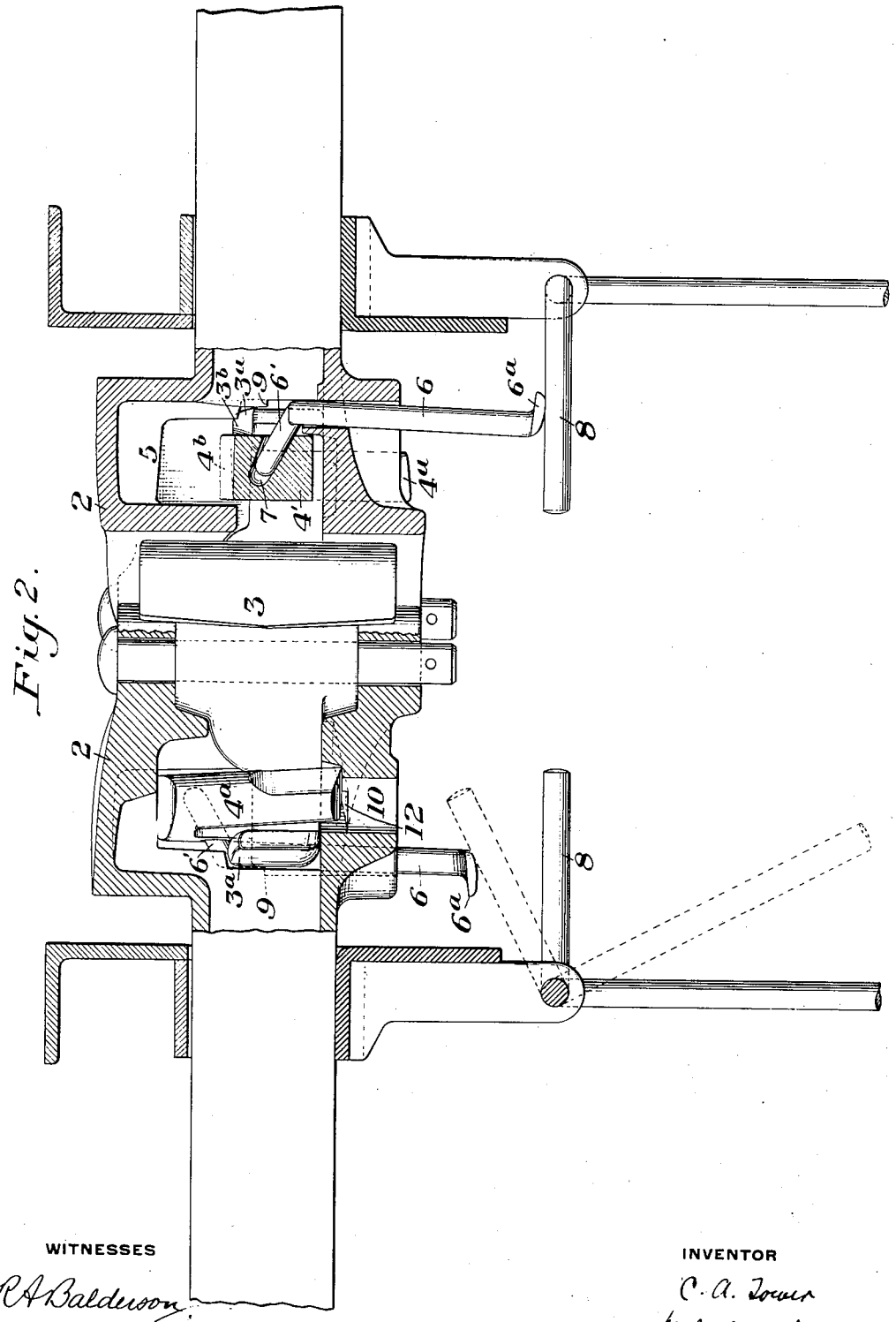

Fig. 2.

WITNESSES

R. A. Balderson

W. W. Swartz

INVENTOR

C. A. Tower

by Baldwin & Hayes

his attys

C. A. TOWER.

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4 SHEETS—SHEET 3.

Fig. 4.

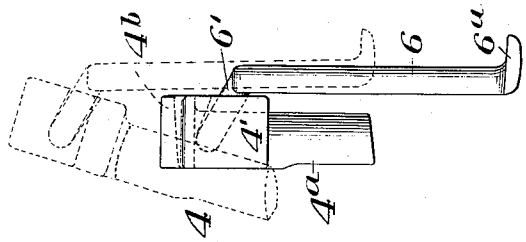


Fig. 5.

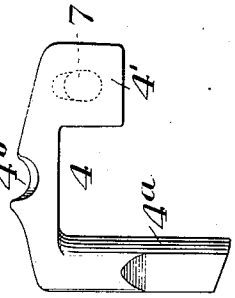
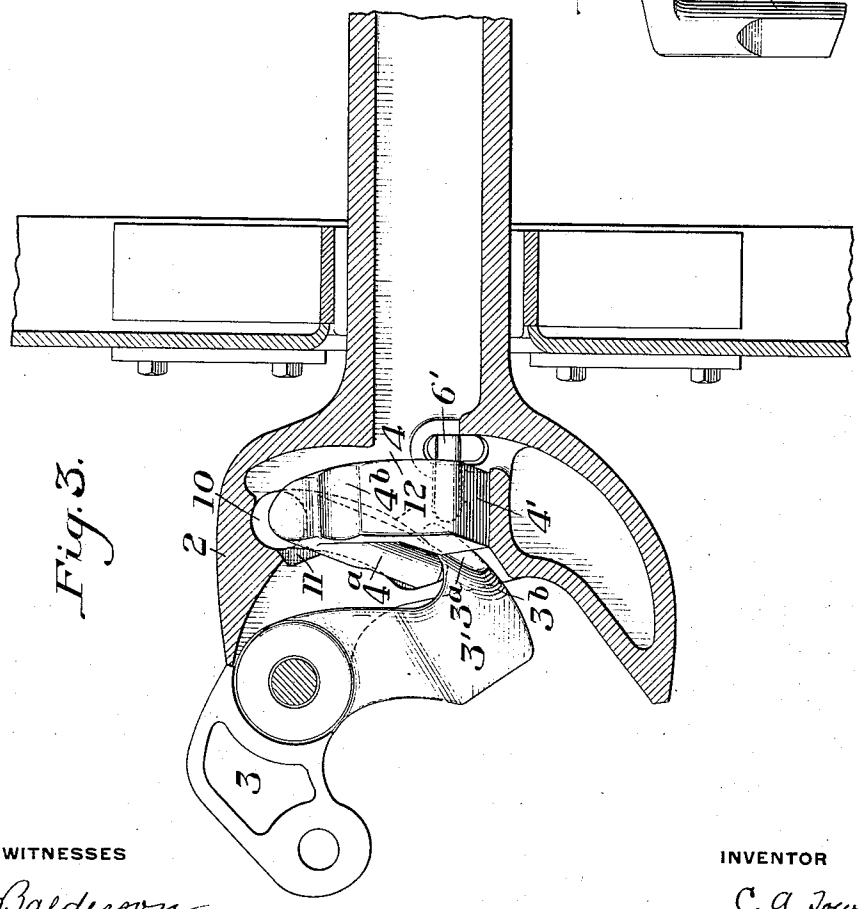


Fig. 3.



WITNESSES

R. A. Balderson

W. W. Swartz

INVENTOR

C. A. Tower

by Ballentine & Symes

his attys.

C. A. TOWER.

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999,915. Patented Aug. 8, 1911.

4 SHEETS—SHEET 4.

Fig. 8.

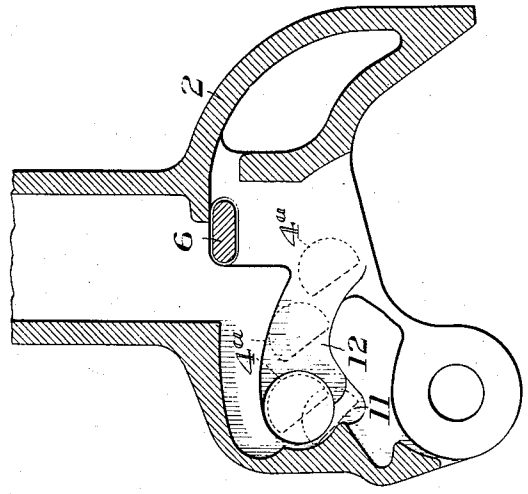


Fig. 7.

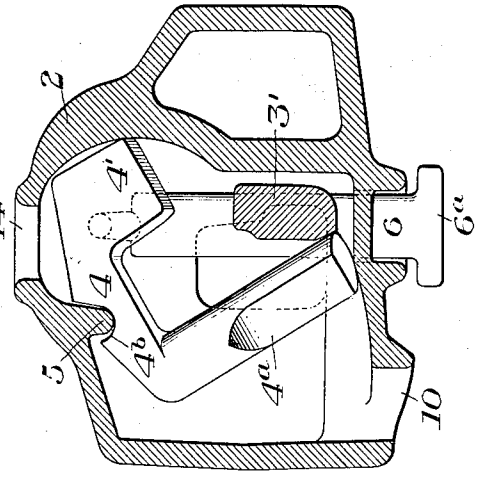
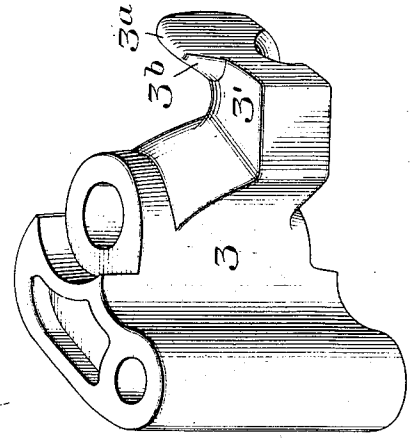


Fig. 6.



WITNESSES

R. A. Baldeson

Fred. H. Parmelee.

INVENTOR

C. A. Tower

by Barlow & Byrnes

his attys

UNITED STATES PATENT OFFICE.

CLINTON A. TOWER, OF CLEVELAND, OHIO, ASSIGNOR TO THE NATIONAL MALLEABLE CASTINGS COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

CAR-COUPLING.

999,915. Specification of Letters Patent. Patented Aug. 8, 1911.

Application filed April 16, 1907. Serial No. 368,496.

To all whom it may concern:

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

Figure 1 is a plan view partly in section showing two couplers in coupled position and embodying my invention; Fig. 2 is a sectional elevation on the irregular line IV—IV of Fig. 1, showing the coupler to the left of the figure with its parts in lock-set position and the coupler to the right with its parts in locked position; Fig. 3 is a sectional plan view showing the knuckle in its opened position; Figs. 4 and 5 are details of the locking and opening means; Fig. 6 is a perspective view of the knuckle; Fig. 7 is a vertical cross section of the coupler with the parts in opened position; Fig. 8 is a horizontal section of the coupler head showing in diagram, by dotted lines, the positions occupied successively by the lower end of the locking and opening piece.

In the drawings, 2 represents the coupler-head, having a pivoted knuckle 3, which is shown in detail in Fig. 6, and is preferably formed with a flat locking face.

4 is the locking and opening piece shown in detail in Fig. 5, having a locking head 4′, a rear opening member 4^a, and an intermediate member having a groove 4^b, which is adapted to engage with a fulcrum-rib 5 on the top wall of the coupler-head. The fulcrum-rib is inclined, as shown in the drawings, and the groove or recess 4^b is preferably made deeper at its forward end than at its rear end, as shown in Fig. 5, so that when the piece 4 is lifted into engagement with the rib 5 there will be a tendency for the piece to tip sidewise in a direction approximately parallel with the length of the draw-bar until it comes to a firm seat on the rib, after which time it will tip at right angles to the rib in a direction transverse to the length of the coupler, as indicated in Figs. 1 and 3 and as hereinafter described.

When in position in the coupler-head, the piece 4 extends over the tail of the knuckle, and when the parts are locked, the head 4′ fits in front of and against the straight surface 3′ of the knuckle-tail, thus locking the same.

The device for lifting the locking and opening piece is shown in Figs. 2 and 4, and consists of a lifting rod 6 which extends up through the floor of the coupler-head, and has a finger 6′ which projects at an upward inclination from the rod 6 and enters an inclined hole 7 in the head 4′. The lower end of the rod 6 is fitted with a shoe 6^a, which is preferably beveled or inclined, as shown, and rests upon an opening lever 8.

In the operation of the device, when it is desired to release the knuckle and to lock-set the lock, that is to say, to place the lock in such position that it will be held from resuming its locked relation to the knuckle and will thus allow the coupled cars to be drawn apart, the operator lifts the lever 8 and thus raises the rod 6. The inclined finger 6′ then rises within the hole 7 and draws the end of the rod away from the shoulder 9 on the inner wall of the coupler-head, which would otherwise prevent it from rising. When the finger 6′ reaches the end of the hole 7 the locking and opening piece 4 is raised thereby until the rear end of the member 4^a is withdrawn from its hole 10 in the floor of the coupler, and the groove 4^b comes into engagement with the rib 5. The base of the member 4^a is thereby moved or swung in a direction which is forward relative to the draw-bar, and is thereby brought over and is caused to seat upon the ledge or seat 11 which is just forward of the hole 10, and the piece 4 is held thereby in unlocked and lock-set position. In order to permit the member 4^a to rest fully upon this lockset shelf close up against the adjacent wall of the coupler head, so that it can not easily be dislodged therefrom by an accidental jar or shock, it is desirable to cut away the side of said member, as shown at 4^b, which accomplishes this result while avoiding the necessity of cutting away and weakening the wall of the coupler adjacent to the lockset shelf.

When it is desired to actuate the parts so as to throw the knuckle open into the posi-

tion shown in Fig. 3, the operator actuates the lever 8 so as to raise the rod 6 to its full extent. This lifts the piece 4 into engagement with the rib 5, releases the locking member 4′ from the knuckle tail, brings the piece 4 into the inclined position shown in Fig. 4, and then causes the piece 4 to tip on the fulcrum 5, and its lower end to swing in a lateral and forward direction shown by dotted lines in Fig. 3 so as to push the knuckle open, actuating it positively to the full extent of its motion. When the knuckle is closed, it will push the member 4^a back along the guiding groove 12 provided for it in the floor of the coupler, until the knuckle reaches closed position and the member 4^a comes directly above the hole 10, whereupon it will drop into said hole and the parts will resume their locked position.

In Fig. 8 I illustrate in diagram the positions successively occupied by the lower end of the locking and opening piece first in lock-setting on the seat 11 in advance of the hole 10, and then in successive positions as it moves transversely in throwing the knuckle.

When the lock is lock-set, as above explained, and the knuckle is pulled open by the motion of the adjoining car with which the coupler is engaged, the outward motion of the knuckle-tail causes a beak 3^a on its upper surface having an inclined inner face 3^b to engage the lower end of the member 4′, unseating the member 4^a from the ledge 11 and drawing it forwardly into the groove 12 so that when the knuckle is again moved into closed position it will engage said member, and push it back into register with the hole 10, as above explained.

As a means for locking the lock so as to prevent it from creeping or from being jarred upwardly into unlocked position, I provide a shoulder 9 (Fig. 2), which is situated on the inner wall of the coupler-head above the end of the rod 6. If the member 4 is jarred upwardly for any cause, the rod 6, having an outward tendency by reason of the fitting of the finger 6′ in the inclined hole 7, will engage the shoulder 9 and will be held thereby. The shoulder, as above explained, offers no obstruction to the lifting of the rod 6, when it is desired to unlock the parts.

In the construction shown in Figs. 1 to 4, the forward tipping of the piece 4 by which it is brought into lock-set position may be accomplished solely by the inclination of the fulcrum 5, or it may be accomplished by the finger 6′, which, as shown, fits with some clearance within the hole 7 and bears on the piece 4 forward of its center of gravity, so that the piece 4 will tend to tip by gravity on the end of the finger and toward the inclined position shown in Fig. 4. Within the scope of my broader claims the manner of effecting this lateral tipping of the piece 4 is not essential.

I prefer, as shown in Fig. 3, to curve the groove 12 forwardly instead of making it straight and nearly at right angles to the draw-bar, since in this way I transmit an easier and more effective opening motion to the knuckle.

I have shown my invention in combination with bottom-opening mechanism, but my invention is not limited thereto, unless otherwise stated in the respective claims.

Within the scope of my invention as broadly claimed, modifications in form and arrangement of the parts may be made, since

What I claim is:

1. A coupler having a coupler head and swinging knuckle, a locking and opening piece and a lock-actuating member, the coupler head having a lock-setting seat at its base in front of the lower end of the locking and opening piece when in locking position, the locking and opening piece being movable in different directions for moving said piece into said seat and for lock-lifting and knuckle-throwing, respectively, said parts being arranged to coöperate to impart said two different movements for lock-setting and for lock-lifting and knuckle-throwing, respectively.

2. A coupler having a locking and opening piece and a top fulcrum whereon said piece is moved transversely of the coupler into opening position, said fulcrum being inclined to direct the piece preliminarily in a forward direction into lock-setting position.

3. A coupler having a locking and opening piece, having a guiding hole in its side, a lifting member entering into the coupler head from below and entering the hole, and a stop in the path of the lifting member, said lifting member being adapted when lifted to move within the hole and out of the path of the stop.

4. A coupler having a locking and opening piece provided with an inclined bearing, a lifting member directed from below and engaging said inclined bearing, and a shoulder on the coupler head in the path of the lifting member, said inclined bearing being adapted to guide the lifting member from said path when the lifting member is raised.

5. A coupler having a locking and opening piece, and a lifting device entering the coupler head from below and pivotally engaging the locking and opening piece forward of its center of gravity, whereby when the piece is lifted, it will tend to swing.

6. In a car coupler, the combination with a coupler head and a knuckle pivotally mounted thereon, of a vertically movable lock for said knuckle provided with a recess which is closed at the top and open at the

bottom, and a lock-to-the-lock member movably mounted in the recess of said lock and extending downwardly through the coupler head, the said lock having an inclined interior wall and the said lock-to-the-lock member being provided with an incline adapted to engage therewith.

In testimony whereof, I have hereunto set my hand.

CLINTON A. TOWER.

Witnesses:
W. L. FOLK,
W. D. FOLK.