

(No Model.)

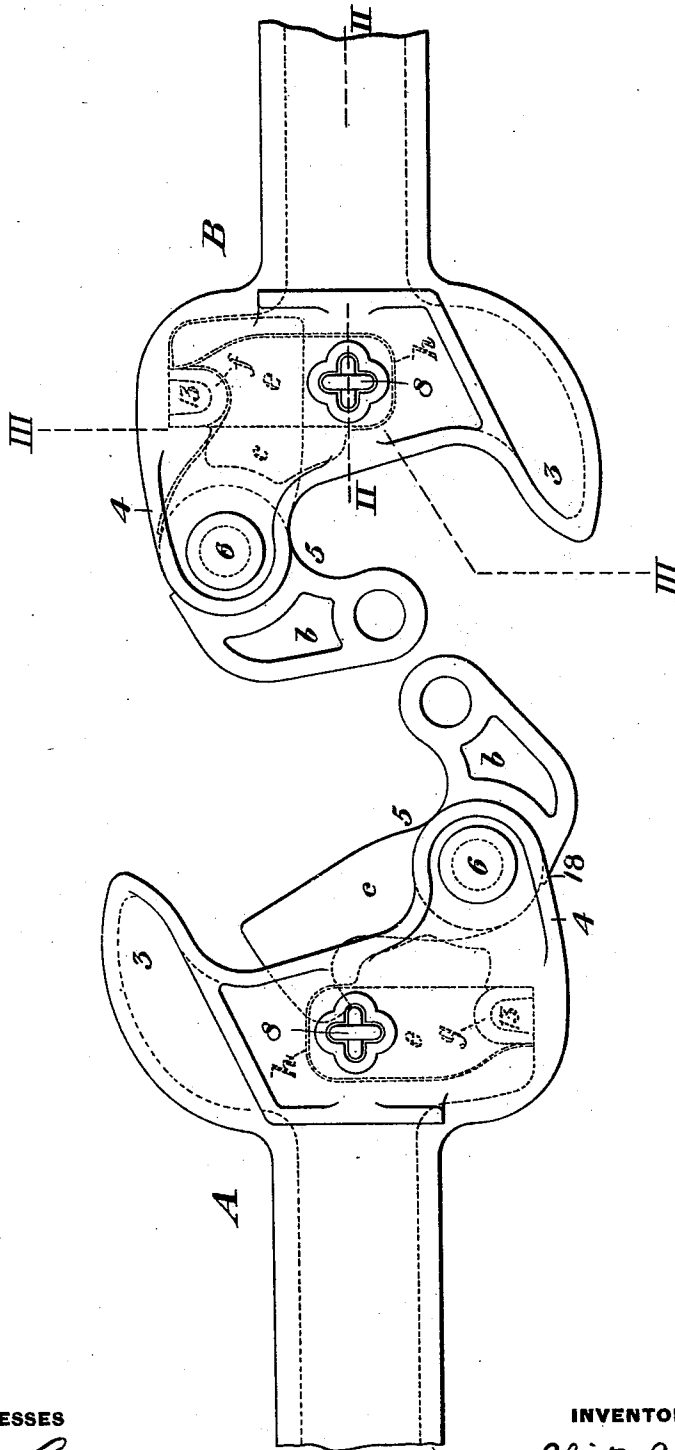
4 Sheets—Sheet 1.

C. A. TOWER.  
CAR COUPLING.

No. 521,092.

Patented June 5, 1894.

*Fig. 1.*



WITNESSES

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*H. L. Gill*

INVENTOR

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*by his Attorney*  
*W. C. Baxendale & Sons.*

(No Model.)

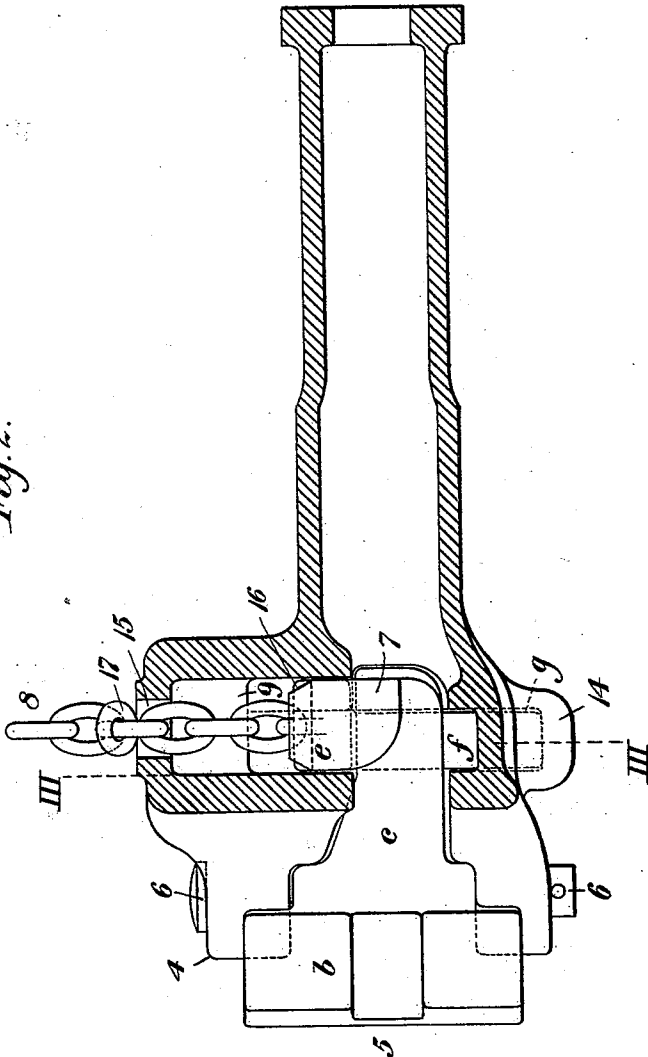
4 Sheets—Sheet 2.

C. A. TOWER.  
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Patented June 5, 1894.

*Fig. 2.*



WITNESSES

*A. M. Corwin*  
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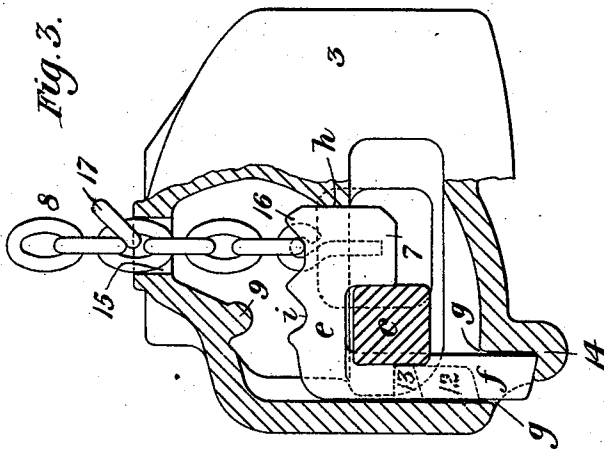
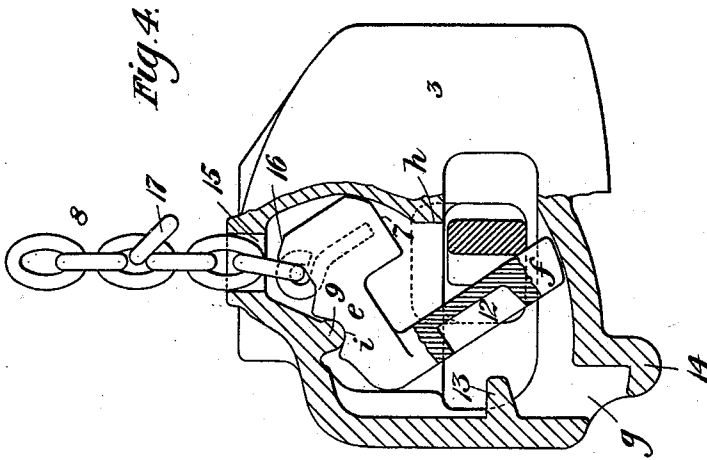
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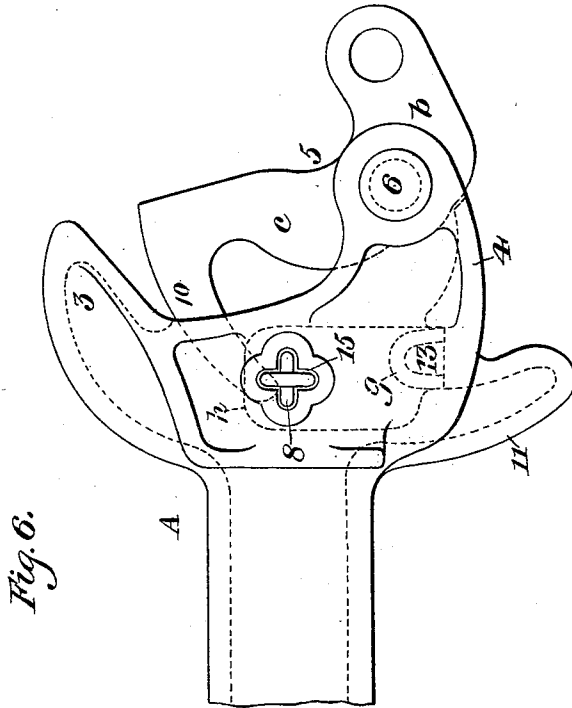


Fig. 6.

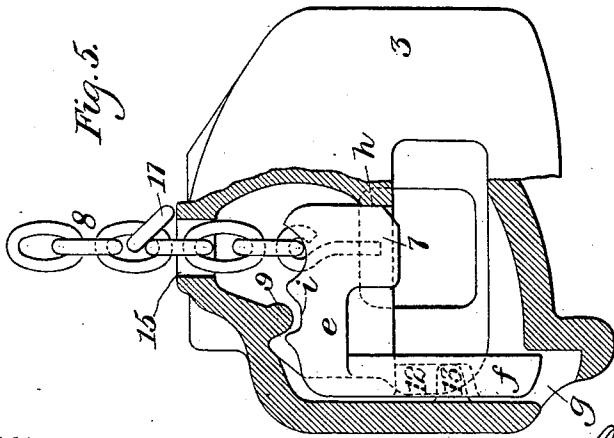


Fig. 5.

Witnesses  
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Inventor  
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 By *Chas. Stewart*  
 Attorney

# UNITED STATES PATENT OFFICE.

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

## CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 521,092, dated June 5, 1894.

Application filed March 26, 1894. Serial No. 505,135. (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

5 the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

10 Figure 1 is a plan view of two of my improved couplers, A and B, the coupler A being shown with its knuckle in unlocked and open position, and the knuckle of the coupler B being shown in locked position. Fig. 2 is a longitudinal section of one of the couplers,

15 the section being on the line II—II of Fig. 1. Fig. 3 is a vertical cross-section on the lines III—III of Figs. 1 and 2, showing the coupler when the knuckle is locked. Fig. 4 is a similar view showing the knuckle unlocked and open. Fig. 5 is a view similar to

20 Fig. 3, showing the locking-block upheld by riding on the rear arm of the knuckle; and Fig. 6 is a plan view showing a coupler of modified construction embodying my invention, the knuckle of the coupler being in open

25 position.

My invention relates to an improvement upon a car coupler for which I have obtained Letters Patent No. 507,511, dated October 24,

30 1893. In the said patent I described a twin-jaw coupler having a swinging knuckle, combined with a locking and opening device, consisting of a single angled piece set without fixed pivot in a recess in the coupler-head

35 in which it is movable vertically, said locking and opening device having three members, viz., a head which engages the front of the knuckle when locked, an arm extending over the knuckle, and a second arm extending

40 vertically back of the tail of the knuckle and fitting within a guide-hole at the base of the coupler-head when the knuckle is locked; said locking and opening device being capable of an initial vertical motion without substantial radial motion in order to first free its

45 head, and the coupler recess being provided with a shoulder adapted to engage said device in its continued motion and to cause it to tip radially in order to open the knuckle.

50 In the use of the coupler of said patent, if

the device be unlocked when the coupler is connected with the coupler of another car, the angled piece can be raised vertically so as to lift its head above the level of the tail of the knuckle, but cannot be raised far

55 enough to tip it radially in the manner above described; so that when the knuckle is then swung open, and the angled piece subsequently dropped, its head will assume a position back of the tail of the knuckle and in

60 the path of its return motion. When the knuckle is swung back again into locked position in the act of coupling with another car, the angled piece must be raised by the engagement of a beveled surface on its head

65 with the knuckle's tail, so as to permit the tail to pass beneath the head and to the rear thereof. This requires an extra motion, and such motion, together with the friction and jarring which result therefrom, are avoided

70 in my present improvement, in which the tail of the knuckle is so constructed that the locking device cannot drop so as to bring its head to the rear of the tail and to require subsequent lifting as above described. This constitutes the first part or item of my invention.

I shall now proceed to describe my invention so that others may apply it to use, prefacing the same with a description of such

80 parts of the coupler described and claimed in my patent above cited, as may be necessary to a complete understanding of the improvement.

In the drawings, A and B are two coupler-heads, which, in general, may be of the usual

85 type. Each coupler-head has two jaws 3 and 4, and is provided with an internal cavity or recess extending laterally into the jaw 4, and adapted to permit the coupling-knuckle 5 to swing upon its pivot-pin 6. The knuckle

90 has an outer arm *b*, and an inner arm or tail *c* set at or nearly at right angles to each other. The angled locking and opening piece above mentioned has an upper and transversely extending member or arm *e* which

95 reaches over the tail of the knuckle, a dependent block or head 7 adapted to fit against the front side of the knuckle's tail and to lock the knuckle when in closed position, and a dependent arm *f* extending downward at the

100

the rear of the knuckle and adapted to pass through a guide-hole *g* in the floor of the coupler-head when the knuckle is locked.

8 is a lifting-chain or link extending from the head 7 up through the top of the coupler-head. When the knuckle is locked as shown in Figs. 2 and 3, the member *e* is above the tail of the knuckle, the head 7 fits in front of it and bears against a shoulder *h* on the coupler-head, and the arm *f* of the angled piece fits within the guide-hole *g*. To release the knuckle and to permit it to be swung into the open position shown at the coupler-head A in Fig. 1, the brakeman raises the chain 8 and thus lifts the angled piece until its head passes above the path of the horizontal motion of the tail of the knuckle, whereupon the knuckle can be swung open, either by direct action of the hand or by continuing the lifting of the angled piece until a notch *i* on the upper side of its member *e* engages a projecting rib or shoulder 9 on the coupler-head, whereupon the angled piece will tip radially in a vertical plane in a direction transverse to the length of the draw-bar, as shown in Fig. 4. The radial motion of the angled piece, by bringing its rearwardly dependent arm into action upon the rear side of the tail of the knuckle, will move it outwardly by a positive action into open position. When the angled piece is released after the knuckle has been opened, the end of its arm *f* will drop upon and be supported by the floor of the coupler. After the knuckle has been swung open and the lifting chain released, the angled piece remains in the position shown in Fig. 4 until the knuckle is swung back into locked position by the act of coupling or otherwise, whereupon the rear side of the tail of the knuckle will engage the arm *f* and will move the angled piece so as to carry the arm back toward a vertical position until its lower end comes into register with the hole *g*, when the angled piece will drop by gravity, its arm *f* entering the hole and its head 7 adjusting itself in front of the knuckle-tail, thus locking the knuckle, as shown in Figs. 2 and 3, and at the coupler-head B in Fig. 1.

The parts above described are shown and claimed in my prior patent above referred to, and, as stated in said patent, the use of said angled piece, which as a single-acting device accomplishes the double function of rising to free the knuckle and of swinging radially to move it open without the accession of cams or levers, is distinctly new and is of great utility. The simplification of construction and the increased safety and durability of the coupler obtained by means of this single and individual body, with its unique attributes while at rest, and while in action, and which in the proper order, at the proper time, and in a novel manner, performs satisfactorily all the necessary functions of locking, unlocking and opening the knuckle, distinguish the invention of said patent practically from all prior devices known to me.

In order to prevent the swinging of the tail of the knuckle in front of the head 7 and the dropping of the head back of the tail, I provide the tail with a lateral projection or arm 10, which extends horizontally and transversely from the end of the tail, and is of such length that when the knuckle is swung open as shown at the coupler-head A in Fig. 1, the end of this arm shall not pass beyond the head 7, but shall occupy an intermediary position between the head and floor of the coupler. Therefore, if for any reason the knuckle should be released by the lifting of the angled piece far enough to clear the knuckle's tail, but not far enough to lift its arm *f* from the hole *g*, and if then the knuckle should be swung open, the angled piece cannot drop so as to bring it behind the tail and in the path of its return motion, but it will be supported by the projecting intermediary arm, as shown in Fig. 5. In a large number of instances, however, the angled piece is not supported by the intermediary arm, for when the conditions permit it to be raised sufficiently, not only to free it from the knuckle, but to tip it radially and to move the knuckle open, the bearing of the lower end of its arm *f* upon the floor of the coupler-head will support the angled piece when it is permitted to drop thereon.

The second part of my invention consists of improved means for upholding the locking and opening device so that it shall not be in actual contact with nor supported by the tail of the knuckle when the latter is locked. It is desirable that it should be thus supported independently of the knuckle, because otherwise it is more apt to be displaced by the jarring of the coupler when the car is in the act of coupling. I show in the drawings two devices for this purpose, both of which may be used and are intended to be included in the claims of this specification, but either of which may be used alone. On the rear side of the arm *f* of the angled piece there is a vertical recess 12 (shown in section in Fig. 4), and within the coupler-head there is an inwardly projecting horn or shoulder 13, these parts being so related in position to each other that when the coupler is locked the horn shall engage the upper end of the recess and shall support the angled piece as shown by dotted lines in Fig. 3. As an alternative construction for accomplishing the same purpose, I may provide the coupler-head at the lower end of the guide-hole *g* with a shoulder 14 on which the extreme end of the arm *f* of the angled piece rests when the coupler is locked and by which the angled piece is supported free of the tail of the knuckle. Other modifications of this part of my invention may be made, the essential principle being that the locking and opening device is supported at a point below the surface of the transverse member *e* by a shoulder or equivalent construction within the coupler-head.

The third item of my invention consists in

means for limiting the swinging or radial motion of the angled locking and opening device, so that in moving the knuckle open it can not be tipped far enough to cause it to jam in the recess in the coupler-head. I may effect this by either one of two constructions. The first construction by which I accomplish this result is to so relate the throw of the tail of the knuckle to the limit of the opening motion afforded by the usual stop 18, that when at completely open position, the rear arm of the knuckle may itself act as a stop to prevent the radial swing of the angled locking and opening device beyond its proper limit.

In the second construction by which I may accomplish the above stated result of preventing the tipping of the locking and opening device far enough to cause it to jam in the recess of the coupler head, I cause the lifting-chain 8 to pass through the hole 15 in the top of the coupler-head, which hole is of + shape formed of two intersecting slots so that it shall serve as a guide for the links of the chain. On the upper side of the head 7 of the angled piece is a shoulder 16, the inclination and position of which are such that when the angled piece has been lifted and the last link of the chain is in the hole 15, the inner side of said shoulder shall engage the link as shown in Fig. 4, and shall press against one side of the same, forcing the other side of the link against the wall of the cross slot of the hole 15, and thus jamming it so as to prevent further tipping or swinging motion of the angled piece. This construction is one that is very desirable in that it is simple and is altogether reliable in its action.

In order to prevent the lifting-chain 8 from dropping within the hole 15 too far, in case its connection with the operating lever or tumbling-shaft should be broken, I provide it with a stop-link 17, the action of which is clearly illustrated in Fig. 3.

I have provided a construction of coupler head and locking device, so that although the latter is inclosed in the coupler-head and can not be seen when the knuckle is unlocked, it comes into view immediately upon the locking of the knuckle by reason of the projection of the lower end of its arm *f* into the guide-hole *g*, and is not visible at any other time. This enables the trainmen to tell at a glance whether or not the coupler is locked, and therefore is of great utility.

In Fig. 6 I show a modified construction of the coupler, in which the jaw 4 is of greater length than in Fig. 1, and the coupler-head is formed with an internal lateral recess or housing 11, into which the intermediary arm 10 extends when the knuckle is locked, but as it is desirable for many reasons that the operation of the knuckle should not be impeded by the bearing of this arm against the front of the recess, I provide sufficient clearance space to permit the knuckle to swing freely

without contact of its sustaining arm with this part of the coupler-head.

The advantages of the several parts of my improvement will be appreciated by those skilled in the use of car-couplers; and within the scope of my invention as defined in the following claims, modifications may be made in the form, construction and position of the parts, and some features of my invention used without the others, since

What I claim, and desire to secure by Letters Patent, is—

1. In a car coupler, a swinging knuckle, a locking device including as one of its members a locking head adapted to fit over the tail of the knuckle, and a downwardly projecting member adapted to be swung laterally to open the knuckle, means whereby said locking device is given a limited initial vertical motion, the length of the locking head and the amount of vertical movement of which the device is capable, being so related that said initial vertical motion frees the locking head from the knuckle, whereby the knuckle may be swung without radial movement of the locking device, said knuckle having a projecting arm extending when closed in a plane transversely from the end of said tail, and adapted when the knuckle is swung open, to support the locking device; substantially as described.

2. A coupler having a swinging knuckle and a radially movable angled locking and opening device having means for lifting it to clear the knuckle and for tipping it subsequently to open the same, said knuckle having a horizontally and transversely projecting intermediary arm of such length and position, that, as the knuckle is swung open, said arm shall continue to occupy a position beneath said device to prevent it from dropping back of the tail of the knuckle, the arms of said locking device being of such relative lengths that said device is supported in its tilted position by the floor of the coupler-head alone and being supported by said arm alone when the knuckle has been opened without radial motion of the angled device.

3. In a coupler having a swinging knuckle with a tail piece, a locking device having a locking head engaging the tail piece and having the transverse member *e* and the vertical member *f* with means for moving the latter radially against the tail of the knuckle to force the latter outwardly, said coupler head being provided with a shoulder located below the plane of the transverse member of the locking device, said vertical member of the locking device being adapted to engage said shoulder, substantially as described.

4. In a coupler having a swinging knuckle with a tail piece, the coupler head having the shoulder 13, the locking device carrying a head engaging the tail piece and having the transverse and vertical members, the latter being provided with the recess, the upper

end of which is adapted to engage the shoulder whereby the transverse member is kept from contact with the knuckle; substantially as described.

5 5. In a coupler, the combination of a swinging knuckle having a rearwardly extending arm and a radially movable angled piece which moves in a vertical plane within the  
10 rear arm of the knuckle, said rear arm serv-

ing as a stop to prevent radial motion of the angled piece beyond a predetermined limit; substantially as described.

In testimony whereof I have hereunto set my hand.

CLINTON A. TOWER.

Witnesses:

O. K. BROOKS,  
D. W. CALL.