

No. 688,526.

Patented Dec. 10, 1901.

W. H. KEEN.  
CAR COUPLING.

(Application filed Jan. 18, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1

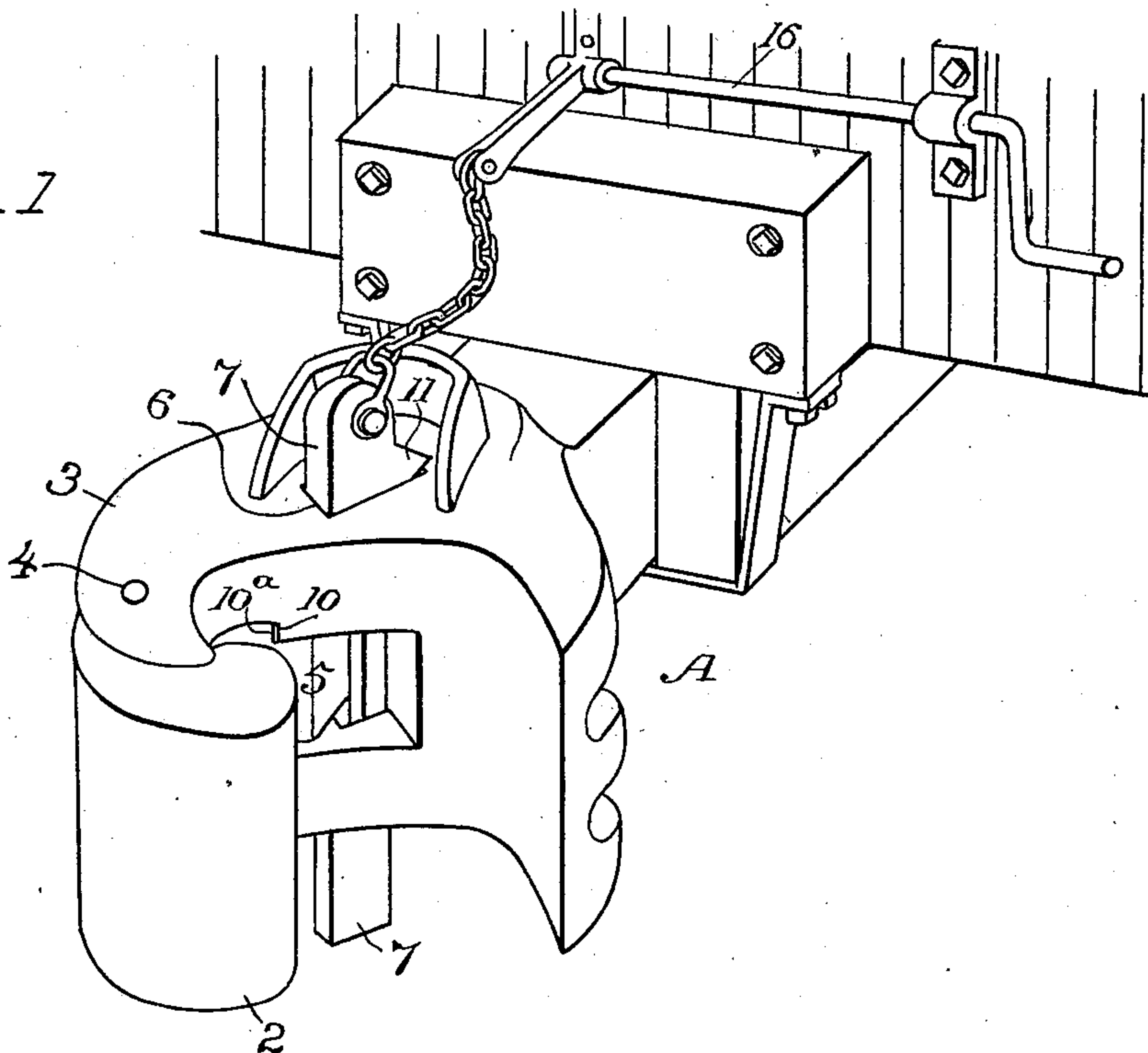


Fig. 2

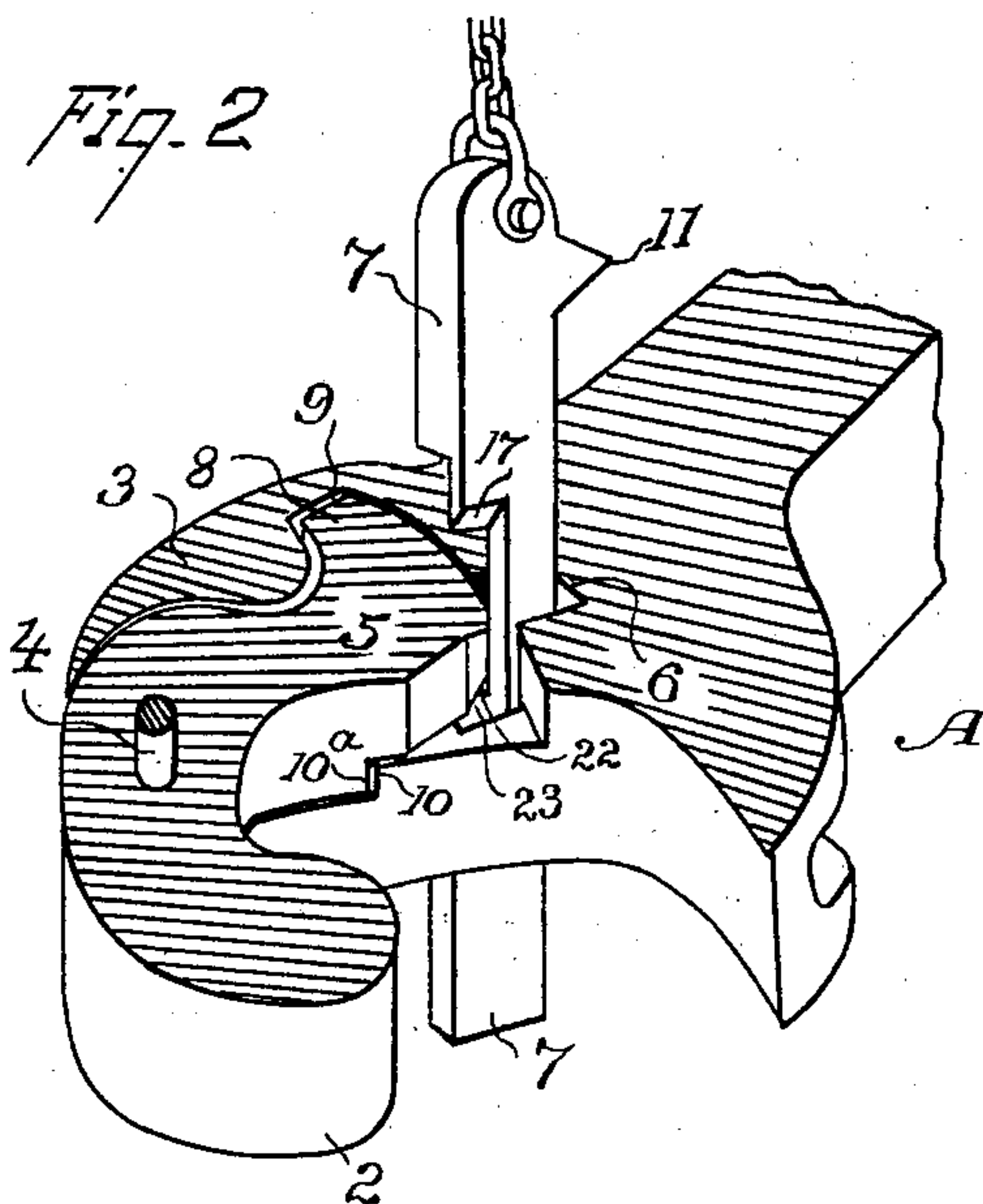
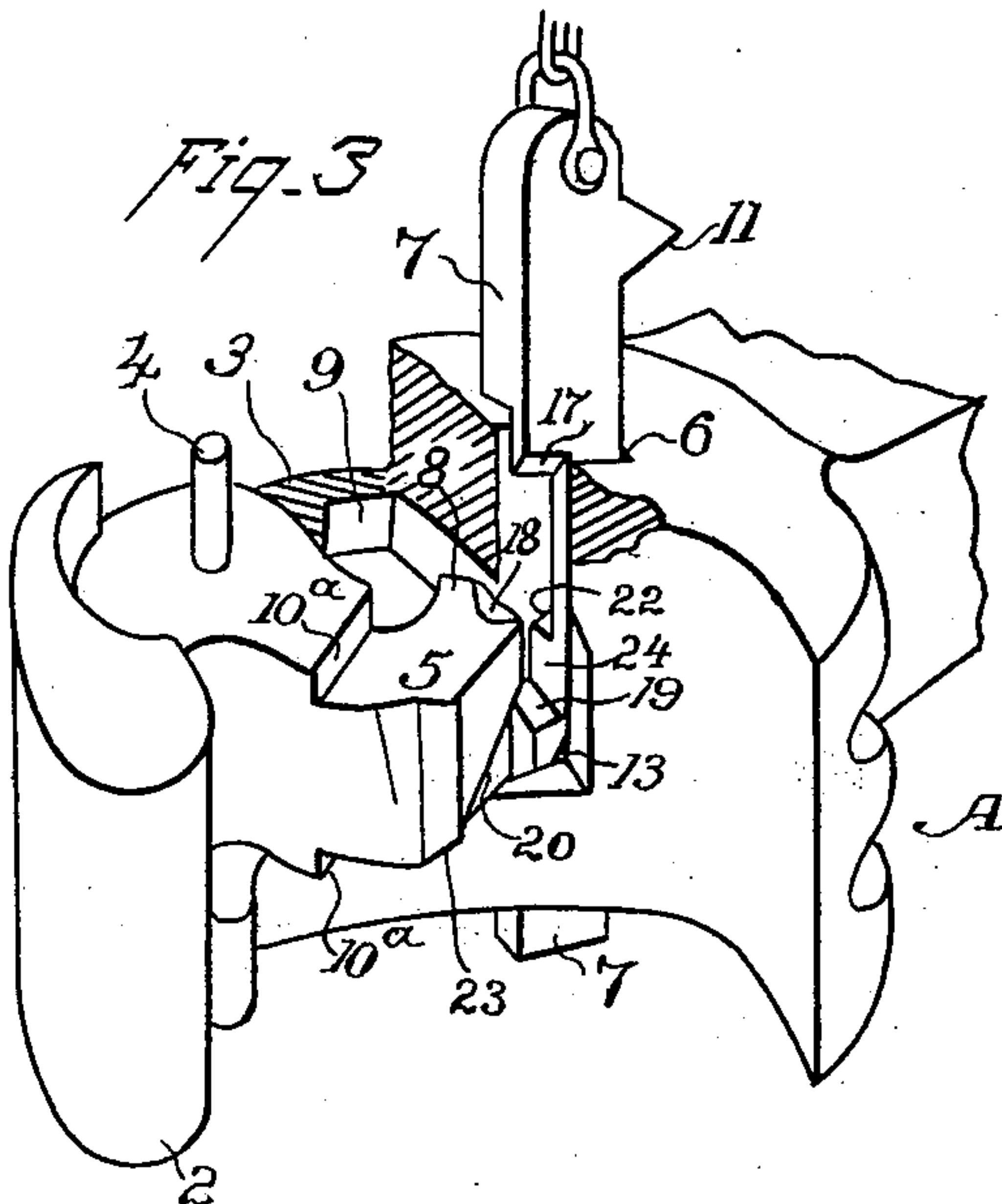


Fig. 3



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# UNITED STATES PATENT OFFICE.

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## CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 688,526, dated December 10, 1901.

Application filed January 18, 1901. Serial No. 43,737. (No model.)

*To all whom it may concern:*

Be it known that I, WALTER H. KEEN, a citizen of the United States, residing at Acampo, county of San Joaquin, State of California, have invented an Improvement in Car-Couplings; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in car-couplings, and is especially applicable to that class of couplings in which the draw-head has a pivoted horizontally-swinging hook or knuckle adapted to engage and interlock with the corresponding knuckle of the opposite draw-head when the two engage and interlock for the purpose of connecting the cars together.

My invention consists in a mechanism by which the swinging hooks or knuckles may be closed and locked when the cars are brought together, means for preventing the disengaging of the lock by what is technically known as "creeping," means for disengaging the lock, so that the cars may stand together without the coupling being locked, and means for positively opening the hooks or knuckles in readiness for coupling.

It also comprises a supplemental lock carried by the hook or knuckle to relieve the swivel-pin, a novel construction of a coupling-pin actuated by gravitation, and means carried by said pin whereby the locking and unlocking are effected.

It also comprises details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a general view of the coupling being locked. Fig. 2 is a horizontal section showing the pin being raised. Fig. 3 shows the coupling unlocked. Fig. 4 is a view of the coupling-pin. Fig. 5 is a view of the opposite side of the pin. Fig. 6 shows the passage for the pin in the draw-head. Fig. 7 shows the coupling unlocked. Fig. 8 shows it locked again.

In the use of car-couplings employing horizontally-swinging hooks or knuckles carried by the draw-heads and adapted to interlock with each other when the cars are coupled and to be swung open to release the coupling much difficulty is experienced in maintain-

ing the parts of the coupling in such condition that they will not disengage and separate by the jar and working of the train while in motion and by the gradual wear of the parts. It is the design of my invention to simplify the construction and the actual number of parts in the coupling to insure a positive locking and interlocking of the engaging knuckles by the operation of a coupling-pin and to provide a positive lock to prevent accidental uncoupling, said lock being formed upon the pin and the passage or channel in the draw-head in which it is slidable.

In the drawings I have shown one draw-head A of a car-coupling having a hook or knuckle 2 pivoted in one arm 3 of the draw-head by means of a vertical pin 4, about which it is turnable in a horizontal plane. The hook or knuckle is formed, as shown, with the outer end of hook portion of a depth approximately equal to the vertical depth from top to bottom of the adjacent part of the draw-head. The central and rear portions of the knuckle are of sufficiently less depth to fit between the upper and lower parts of a horizontal mortise formed in the arm of the draw-head, and the tailpiece 5 of the knuckle swings into and out of the rear portion of this mortise. A vertical opening 6 is made in the draw-head approximately central to the line of draft, and in the present construction it is shown as rectangular in shape and intersecting the rear or inner portion of the mortise in the draw-head within which the tailpiece 5 swings, and a rectangular coupling-pin 7 is slidable so as to drop by gravitation in the slot or passage 6, so that when the hook or knuckle has been swung into a coupling position the tailpiece 5 will have passed beyond the line of the coupling-pin and the latter will drop, so as to engage the front edge of the tailpiece, and thus prevent it from again swinging outwardly to allow of uncoupling. The tailpiece 5 has a reversely-curved hook 8 projecting backwardly and adapted to enter and engage with a correspondingly-formed socket 9 in the draw-head, so that when the parts are in position for coupling, this hook engaging the socket and the coupling-pin 7 being in position to engage the front of the tailpiece, it will be seen that any pull upon the hook or knuckle will be resisted by the



interlocking of the lug 8 in its socket 9 and the engagement of the tailpiece 5 with the coupling-pin 7, and the pivot-pin 4, about which the knuckle is turnable, will be relieved of any strain caused by the pull upon the coupling.

The action when the coupling-pin is in place is sufficiently secure to retain the coupling in its interlocked position even if the pivot-pin 4 be withdrawn.

In order to relieve the parts of shocks caused by the forcible striking when the cars come together, the tailpiece 5 is made somewhat thinner than the central portion, which swings in the mortise of the draw-head, and the rear portion of this mortise is made to correspondingly fit the tailpiece. This forms shoulders in the mortise, as at 10, and corresponding shoulders 10<sup>a</sup> upon the tailpiece, which abut against the shoulders of the draw-head when the coupling is closed, and thus receive such shocks and relieve the operating parts of injurious strains, because when thus closed with these shoulders in contact the knuckle is essentially a part and continuation of the draw-head itself.

The vertical hole or passage 6, through which the coupling-pin passes, is here shown as made rectangular in form and having a major diameter greater than the major diameter of the pin 7, so that the latter may be moved from the front to the rear of the opening for the purpose of engaging with the tailpiece or being disengaged therefrom.

The pin 7 has a head extending to one side in the direction of its longer diameter and beveled or shaped approximately as shown at 11, so that when the pin has dropped into position for coupling the cars this projection fits into and fills the space left at one side of the pin by reason of the greater diameter of the pin-opening. This prevents the entrance of dirt, ice, and snow, which would be liable to clog the action of the parts. The pin is operated by inclines or bevels formed upon itself and corresponding inclines within the slot 6, in which it is movable. These inclines are preferably arranged one near the top and the other near the bottom, so that the upper and lower part of the pin will be moved simultaneously forward or backward, and it will be thus maintained in an approximately vertical position at any point in its movement. It will be understood that the inclines may be made upon any suitable or convenient part of the pin, either upon the rear or, as shown in the present case, upon the side and top. As here illustrated the projection 11, which forms a closure for the top of the slot 6, is slidable against the rear angle 12 at the top of the slot, while the inclined offset 13 near the lower part of the pin is slidable upon a corresponding incline 14 made within the lower part of the channel 6, so that when the pin is raised it can move to the rear part of the channel 6, and when it is dropped the inclines 11 and 13 slide, respectively, upon the

angle 12 or an equivalent incline and the incline 14, thus forcing the pin toward the front edge of the slot, and as this slot intersects the mortise in the draw-head within which the tailpiece 5 is turnable it will be seen that as soon as the hook or knuckle has been closed sufficiently for coupling the tailpiece will have passed behind the front edge of the pin 7, and the latter will then drop by gravitation, so that its front edge stands in front of the tailpiece and prevents the latter from being withdrawn.

The central portion of the pin 7 is cut away, as at 15, thus making the pin narrower at that point than it is above and below. This part 15 coincides with or stands opposite to the tailpiece when the pin is lifted, so that the lifting of the pin retracts it, sliding upon its inclines, so that the tailpiece is no longer locked by the pin, but can swing outwardly at any time to allow the cars to be separated. When the pin is raised for the purpose of uncoupling, the bevel or incline 22 at the side of the cut-away space 15 contacts with the lower angle 23 of the tailpiece, and this forces the pin back and disengages it from the tailpiece. The latter thus stands opposite the full face 24 of the pin, and this prevents the reengagement of the parts and leaves the tailpiece in position to swing clear of the pin when actual uncoupling takes place. This pin is thus raised and lowered by the usual bell-crank lever 16, which is journaled upon the end of the car, having one arm within reach of an operator and the other arm connected by a chain with the top of the pin. When the pin has dropped to its position in engagement with the tailpiece 5, the upper edge 17 of the cut-away portion 15 of the pin will have dropped below the top of the tailpiece sufficiently to form a lock of such character as to prevent the possibility of any separation of the parts by creeping or by any action that is likely to occur during the movement of the train.

When the cars are separated, it is desirable to swing the knuckle 2 outwardly to its fullest extent, and this brings the tailpiece 5 forward. The coupling-pin 7 will drop to its lowest point by gravitation when not held up by exterior means, such as a pawl, and the parts are then in position for automatic coupling whenever the draw-heads of two cars come together. The knuckle of one draw-head will strike the front of the tailpiece 5 and will push it back, thus raising the pin 7, as will be hereinafter described, and allowing the tailpiece to swing upwardly until it has passed behind the pin and the latter has dropped into position to lock it. As the shoulder 17 stands below the upper surface of the tailpiece when the pin is in its lowest position, it is necessary to provide a means for raising and retracting the pin automatically when the coupling is to take place. For this reason the shoulder 17 is beveled or inclined, as shown, and the lug 8 of the tailpiece has its



upper surface inclined or beveled, as shown at 18, sufficiently so that it will strike the bevel 17 when the tailpiece swings backwardly and will lift the pin. The pin is also  
 5 locked against creeping by reason of the incline 13 dropping below the angle of the incline 14, so that the two vertical faces, respectively, of the pin and of the projection which forms the incline 14 stand against each other,  
 10 which prevents any tendency of the pin to move backward and disengage from the tailpiece. When, as above described, the tailpiece is swung back, the incline or bevel 18, contacting with the bevel of the shoulder 17,  
 15 will first lift the pin, disengaging the vertical faces contiguous to the inclines 13 and 14, so that the pin is at liberty to move toward the rear part of its slot, at the same time sliding up the incline 14, so as to allow the  
 20 tailpiece to swing to the position where it can be locked. The face or edge of the tailpiece which strikes the pin is curved or inclined eccentrically to its pivot-pin 4, so that when it strikes the pin 7 it first lifts it slightly,  
 25 and then, pressing against the edge of the pin at the cut-away portion 15, it forces the pin upward and backward in its slot, so as to allow the tailpiece to swing past it, and as soon as the front edge of the tailpiece has  
 30 passed the pin the latter will drop by gravitation into position, which locks the tailpiece in place. In this position the rear hook 8 of the tailpiece has engaged with its socket 9 in the draw-head, and the shoulders 10 and  
 35 10<sup>a</sup> of the mortise and knuckle are also in contact, and the whole structure is very solid to resist shocks or the strain of sudden pulls.

When the coupling-pin has been raised sufficiently to allow the knuckle to swing freely  
 40 for uncoupling purposes, it may, as previously stated, be held in that position without entirely lifting the pin, and this allows the couplings to be separated at any time when a car is to be pulled away and one to remain.

45 When the cars are separated, it is desirable to open the knuckle into position for a subsequent coupling. This is effected by turning the bell-crank lever 16 so as to pull the pin up to its highest point. When this is  
 50 done, the beveled shoulder 19 at the lower end of the cut-away portion 15 engages a correspondingly-shaped incline 20 formed on the lower surface of the tailpiece, and these inclines are sufficiently steep or inclined to each  
 55 other so that the pulling up of the pin acts positively to swing the knuckle or hook around its pivot-pin, and thus throw it wide open ready for another coupling.

Having thus described my invention, what  
 60 I claim as new, and desire to secure by Letters Patent, is—

1. The combination in a car-coupler of a draw-head having a horizontal mortise, a swinging hook or knuckle pivoted to the draw-head and having a rear tailpiece projecting  
 65 into said mortise, said draw-head having a vertical opening intersecting the mortise and

having inclines near the upper and lower ends, and a coupling-pin having inclines near the upper and lower ends and which inclines are  
 70 constructed to overlap or pass those in the vertical opening of the draw-head whereby the inclines present vertical contact-faces to form a lock.

2. The combination in a car-coupler of a  
 75 draw-head having a horizontal mortise, a hook or knuckle pivoted and horizontally turnable with relation to the draw-head having a tailpiece projecting into the mortise, a vertical rectangular opening in the draw-head inter-  
 80 secting the mortise and having inclines near the upper and lower end, a coupling-pin, the major axis of which is less than that of the pin-opening, inclines carried by the pin and engaging the inclines of the pin-opening to  
 85 force the pin forward in position to lock the swinging tailpiece, said inclines upon the pin and opening being so constructed as to overlap or pass each other and present vertical contact-faces to form a lock, when the pin is  
 90 set at its lowest point.

3. The combination in a car-coupling of a horizontally-mortised draw-head having a vertical rectangular coupling-pin opening inter-  
 95 secting the rear of the mortise, said opening having inclines near its upper and lower end, a hook or knuckle pivoted to the draw-head having a tailpiece adapted to swing within the mortise and across the line of the coupling-pin opening, and a pin having corre-  
 100 sponding inclines engaging those in the said opening whereby the pin is forced to the front of its opening by gravitation to engage the tailpiece, said inclines upon the pin and in the opening adapted to overlap or pass each  
 105 other and present vertical contact-faces to form a lock, a cut-away portion of the pin made between the opposite ends thereof and through which the tailpiece is adapted to swing when the pin is retracted, and a shoulder  
 110 formed at the upper part of said cut-away portion and dropping below the upper edge of the tailpiece when interlocked therewith.

4. In a car-coupling, a horizontally-mortised draw-head, a hook or knuckle pivoted thereto  
 115 having a tailpiece projecting into the mortise, a vertical coupling-pin opening intersecting the rear end of the mortise and having inclines formed near the upper and lower end, a coupling-pin, the major axis of which is less  
 120 than that of the opening, said pin having inclines adapted to engage those of the opening and to force the pin forward when it drops by gravitation, a centrally-located cut-away portion of the front of the pin which coincides  
 125 with the tailpiece and allows the latter to pass when the pin is raised, an inclined shoulder at the upper part of said cut-away portion and a corresponding formation upon the tailpiece whereby the latter acts to raise the  
 130 pin automatically so as to pass it when swinging into coupling position.

5. The combination in a car-coupler of a horizontally-mortised draw-head, a hook or



knuckle pivoted to the draw-head having a tailpiece projecting into the mortise, a vertical coupling-pin opening intersecting the path of travel of the tailpiece, a coupling-pin  
 5 of less diameter than that of the pin-opening, and having the central front portion cut away so that when raised and the pin retracted said portion coincides with the tailpiece, and allows the latter to swing past it, inclines upon  
 10 the pin and within the opening whereby the pin may be retracted transversely when raised and advanced to interlock with the tailpiece when dropped, said inclines adapted to overlap or pass each other and present vertical  
 15 contact-faces to form a lock, an incline upon the under surface of the tailpiece, a corresponding shoulder at one side of the bottom of the cut-away portion of the pin adapted to engage the incline of the tailpiece and to  
 20 force the latter outward and swing the knuckle backward when the pin is forcibly raised.

6. The combination in a car-coupler of a draw-head having a horizontal mortise formed in one side said mortise having shoulders arranged in different horizontal elevations intermediate of its length, a knuckle having a  
 25 tailpiece projecting into the mortise, and pivoted therein, said mortise having a chamber in the rear and said knuckle having a hook  
 30 at its rear to enter said chamber when the parts are in a coupling position, a pivot-pin about which the knuckle is turnable and shoulders on the under face of the tailpiece and adapted to abut against the shoulders of

the mortise when the parts are in a coupling 35 position whereby the shoulders support the parts against shocks and relieve the pivot-pin therefrom, and a vertical slidable pin having upper and lower inclines adapted to overlap or pass those in the pin-opening and present 40 vertical contact-faces to form a lock said slidable pin movable in the pin-opening in the draw-head so as to intersect the path of travel of the tailpiece, and coacting with the hook of the tailpiece and the chamber therefor to 45 retain the parts in position independently of the pivot-pin of the knuckle.

7. The combination in a car-coupler of a draw-head having a horizontal mortise, a hook or knuckle pivoted therein and horizontally 50 turnable with relation to the draw-head, with a tailpiece projecting into the mortise, a vertical rectangular pin-opening intersecting the mortise, a pin slidable therein, and inclines on the pin and in the pin-opening by which 55 the pin is engaged with the tailpiece by gravitation, said inclines adapted to overlap and present vertical contact-faces to form a lock, and said pin having an incline 22 which engages the lower angle of the tailpiece when 60 the pin is raised, and moves it back to release the tailpiece.

In witness whereof I have hereunto set my hand.

WALTER H. KEEN.

Witnesses:

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CHAS. E. TOWNSEND.