

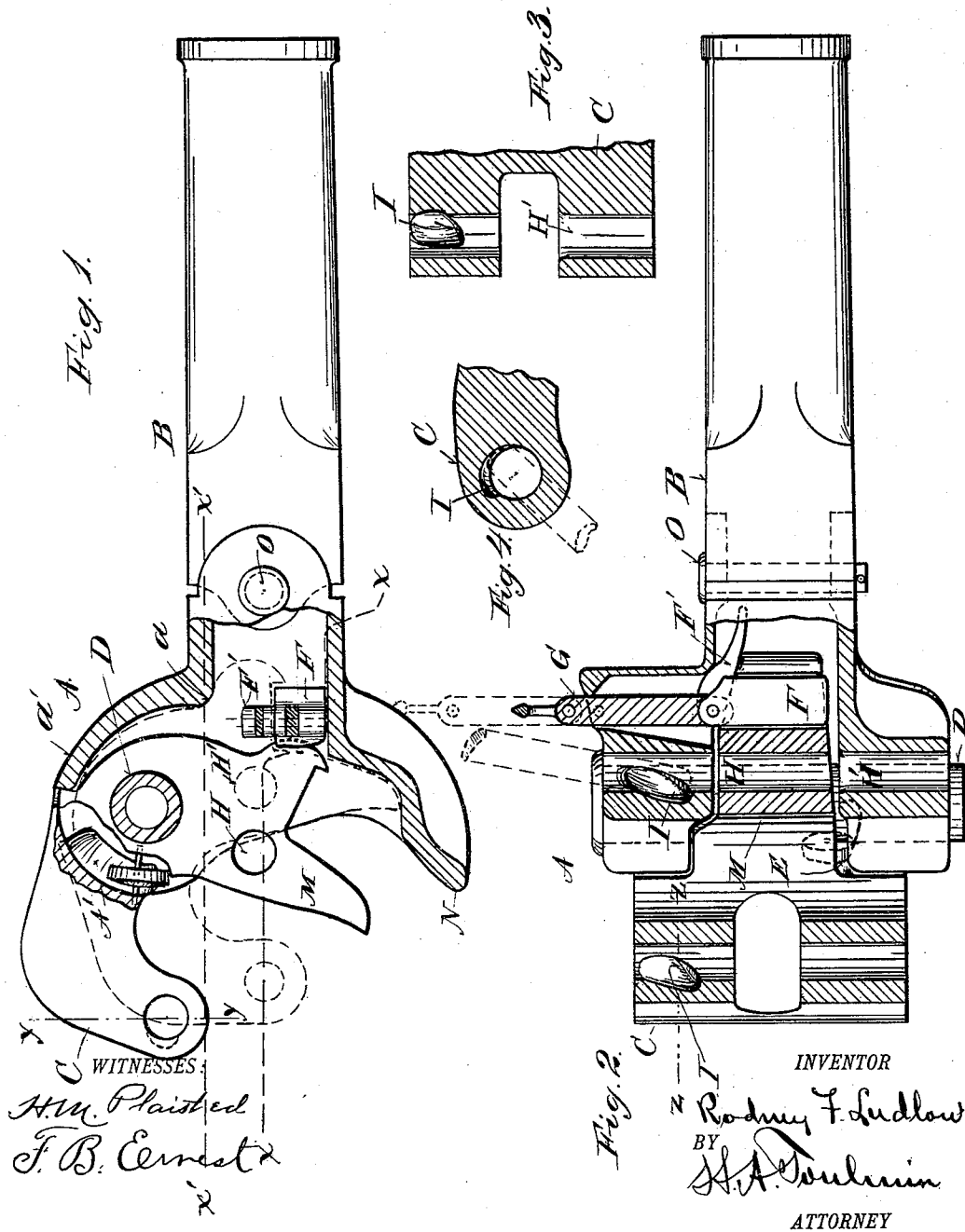
(No Model.)

3 Sheets—Sheet 1.

R. F. LUDLOW.
CAR COUPLING.

No. 488,769.

Patented Dec. 27, 1892.



(No Model.)

3 Sheets—Sheet 2.

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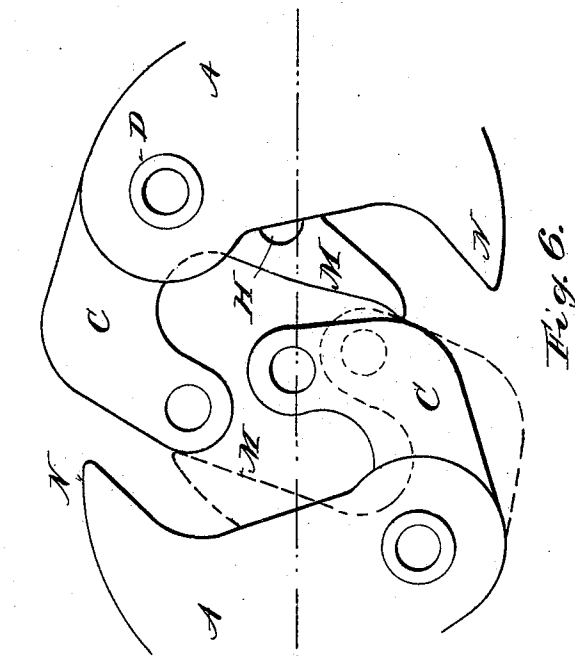
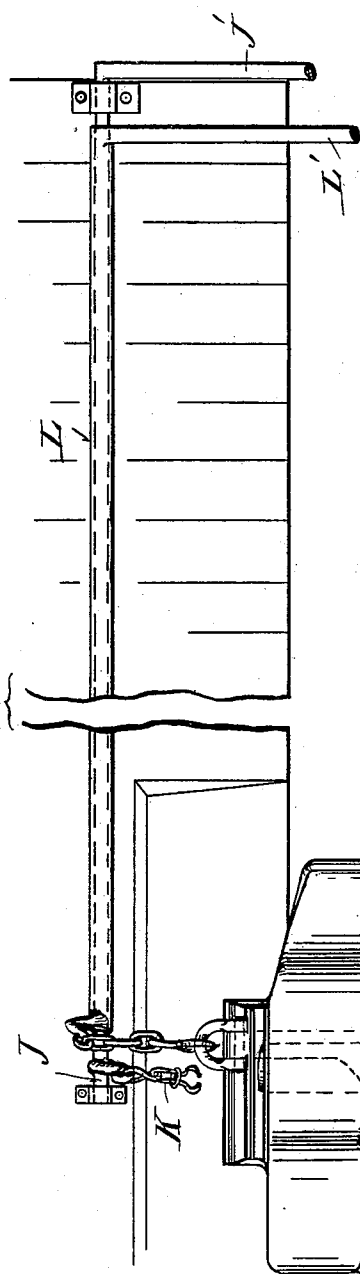


Fig. 6.

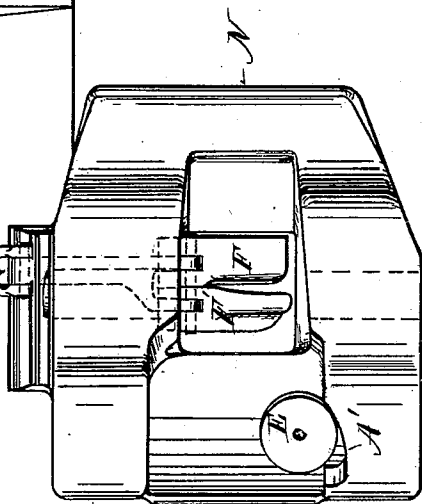


Fig. 5.

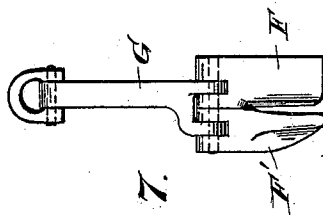


Fig. 7.

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(No Model.)

3 Sheets—Sheet 3.

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Fig. 10.

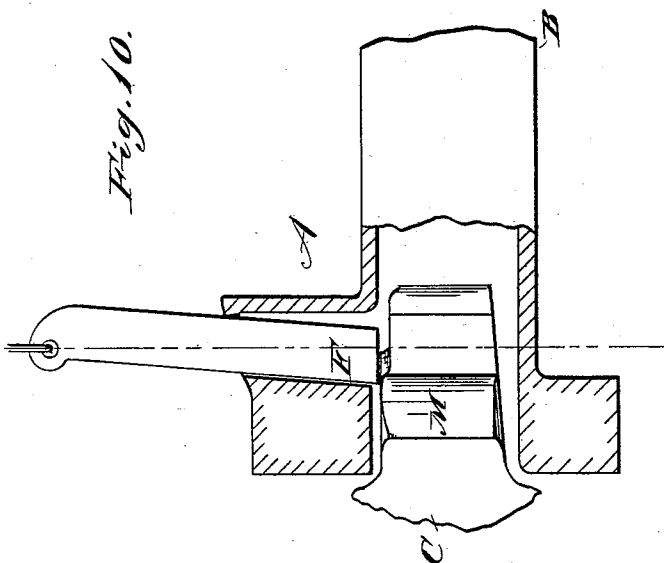


Fig. 8.

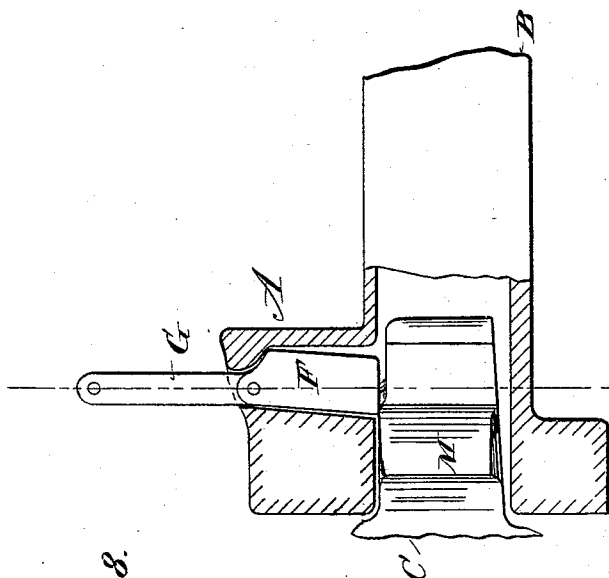
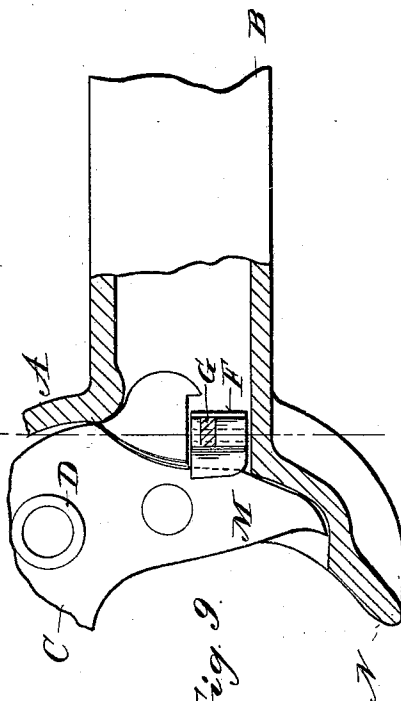


Fig. 9.



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CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 488,769, dated December 27, 1892.

Application filed June 3, 1892. Serial No. 435,347. (No model.)

To all whom it may concern:

Be it known that I, RODNEY F. LUDLOW, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Car-Couplers, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to certain new and useful improvements in car couplers.

My improvements have reference to the construction and the mounting of a wheel-supported knuckle in a draw-head, whereby the strain of coupling is taken from the wheel; have reference to a vertically movable locking pawl or piece; have reference to a compound operating lever for raising said pawl, and for raising the coupling pin when used with a link and pin coupler; and have reference to other points hereinafter described and claimed.

In the accompanying drawings on which like reference letters indicate corresponding parts: Figure 1, represents a plan view of a coupler, with parts broken away to show the construction and the knuckle in its open position; Fig. 2, a vertical section on the line *xx* of Fig. 1; Fig. 3, a partial section on the line *yy* Fig. 1; Fig. 4, a horizontal section on the line *zz* Fig. 2; Fig. 5, a front view of the coupler with the knuckle removed, and the compound levers shown; Fig. 6, a plan view of a pair of draw-heads, illustrating the method of coupling and the action of the guiding lugs on the knuckles; Fig. 7, a detail view of the vertically movable locking pawl; and Figs. 8, 9 and 10 modifications thereof.

In a previous application filed September 28, 1891, Serial No. 407,023, I have shown and claimed a wheel-supported knuckle and an irregular ledge therefor; also a locking pawl pivoted in the draw-head. In the present application I provide the path for the wheel at the opposite side of the knuckle pivot from that shown in the application above mentioned, and mount said locking pawl so as to be vertically movable in the head, the advantages of which will be presently set forth.

Referring to the drawings, the letter A designates the draw-head, the letter B the draw-bar proper and the letter C the knuckle pivot-

oted in the draw-head by the pivot pin D, shown in Figs. 1 and 5; an irregular path or ledge A' in the lower ear of the head is provided, on which travels a wheel E, mounted in the knuckle and supporting the same, the inclination of the ledge effecting an automatic swing of the knuckle when freed from the locking device. The wheel is shown at the upper end of the incline in Fig. 5, which position it will assume when the knuckle is swung inward to its coupling position. Any tendency of the knuckle to work back and forth by the play of its connections, such as under the blow of coupling, will tend to roll the wheel down its path and relieve the strain thereon, instead of compressing the wheel against the incline and tending to roll it up the path, as is the case when the wheel is located on the other side of the knuckle pivot. Thus all tendency to crush or fracture the supporting wheel under the blow of coupling, or otherwise, is avoided. The wheel is protected by an inclosing web of the knuckle as seen in Fig. 2. The coupling strain or thrust due to coupling is also exerted on a line *x'* parallel to the axis. The coupled position of the knuckle is shown by dotted lines in Fig. 1; it will be seen from this figure that the rear end or heel of the knuckle bears against the shoulder *a*, of the draw-head, which receives the thrust directly. This relieves the strain on the pivot D; it also obviates any tendency to fracture the inclosing wall *a'*, as the knuckle does not bear against it in its coupled position.

In the above application referred to, I have described and claimed a locking pawl allowing automatic coupling. In the present application I mount this pawl F on a vertically movable pivot connected to a pin G, slidably mounted in the draw-head, as shown in Fig. 2. The pawl F operates by swinging backward in the direction of the arrow Fig. 2 when coupling with an ordinary link and pin, and the knuckle is removed. By raising the pin and pawl into the housing of the head as shown by dotted lines Fig. 2, the knuckle is free to swing outward. The auxiliary pawl F' supports the locking pawl F in its raised position, till the knuckles are opened by the separation of the cars. The locking pawl is

thus vertically movable to lock and unlock the knuckle, and oscillating or swinging in its motion, to allow of coupling link and pin.

In the holes for the coupling pin in the knuckle and draw-head respectively, I have provided an inclined supporting notch or ledge I. The sectional views in Figs. 2 and 3 show the twist or inclination of the said notch; the cross sectional view in Fig. 4 shows the gradually increasing width of the notch or ledge, and the length of the notch with regard to the hole. When it is desired to couple the cars with a link and pin coupler the coupling pin is mounted on the side of this incline, as indicated by dotted lines in Figs. 2 and 4, the end of the pin resting about midway of the incline which supports it till the jar of the meeting couplers causes it to slip therefrom into the link and hole. The inclination of this notch or ledge, will give a slight rotary or twisting action to the coupling pin and cause it to fall vertically and meet the hole in the lower ear of the head or the knuckle. The action of the twist given to the coupling pin, is similar to the twist given to a bullet by the grooves of a rifle; that is to say, it rotates the pin and causes it to fall vertically and axially. I wish to claim this broadly. I have provided this twist in both the knuckle and the draw-head hole for the coupling pin. The couplers may thus be automatically coupled, and positively, either by the locking pawl, or the coupling pin. I will show yet another way of automatic coupling. In Fig. 1 the knuckle is shown provided with a hole H adapted to receive the coupling pin in the inner position of the knuckle, as shown in Fig. 2. When the knuckle is opened, the pin may rest on the inner end or heel of the incline as indicated by dotted lines at H'; when the knuckle is swung inward the pin will slip down and lock the knuckle in its inner position. This arrangement may be used therefore, in case any accident should happen to the locking pawl F. That is to say the hole H provides a safety or auxiliary locking means. Thus three ways of automatic coupling are shown in the present application; namely by the locking pawl, the twisted inclined ledge for the coupling pin, and the hole H in the inner end of the knuckle. When the coupling pin is used in either of the latter modes of coupling, it may be readily uncoupled from the sides of the car, by means of a lever J, having a spring clamp or other gripping means K, on one end thereof, adapted to be secured to the coupling pin, and operated by the handle J' at the side of the car. This lever is shown in Fig. 5 as mounted within the tubular lever L operated by the handle L', and connected at the other end with the vertically movable locking device. The two levers therefore take up scarcely more space than one, while they effect an independent uncoupling action of either the locking pawl or the coupling pin as may be desired.

Referring to Fig 6, the heads of two coup-

lers are shown in the act of coupling. In the form of knuckle illustrated I have provided an outwardly extending, lateral lug or projection M, having an inclined forward face as seen in Fig. 1 and adapted to receive the head of the opposing knuckle, whether in the closed position of said knuckle, as shown by full lines in Fig. 6, or in the open position as shown by dotted lines,—and guide the knuckle inward to its coupling position with the corresponding knuckle. In other words, this lateral lug effects a self coupling or automatic movement of the knuckles, themselves without depending on the guiding horn or end N, on the draw-head. In fact this horn may be entirely done away with as far as its aid in drawing the knuckles to their inner position is concerned. It may, however, be retained for safety, though it may be as much reduced in size as may be desired. When both the knuckles are open, as indicated in Fig. 6, each lateral, forwardly extending lug, will engage with, and guide inward toward the center line, the opposing knuckle. I wish to lay broad claim to this lateral lug with an incline or guiding face, acting as above described.

In the ordinary form of couplers of this style commonly called the Janney type, more or less play is given between their knuckles in their coupled position, to allow of passing the curves of the track. I propose to pivot the draw-head and draw-bar on a substantially vertical axis, and thus allow a closer gripping action of the couplers, since the play or swing of the parts is provided for by this means of jointing. I have shown one form and location of this vertical pivot in Figs. 1 and 2, but wish to be understood as laying broad claim to the same, whatever the location or construction of the parts. In the form shown, I have provided intermatching lugs on the draw-head and draw-bar respectively, provided openings for the pivot pin O; the parts lock on each other in their horizontal swing,—the amount of the play or swing being shown at the sides in Fig. 1.

In a previous application Serial No. 404,506, filed September 2, 1891, I have shown, described and claimed an auxiliary pawl together with a locking pawl. I do not therefore lay broad claim in this application to this auxiliary pawl, the same being so claimed in the application just referred to.

The inclined face on which the wheel E travels may be otherwise located than as shown, so long as the said face tends to relieve the strain on the supporting wheel in the act of coupling, and allow it to run down the incline more or less, instead of pinching or gripping it by opposing to the wheel a surface which it must travel up more or less, under the thrust and play of the coupled parts. As seen from the drawings, the axis of the wheel is nearly parallel to the axis of the draw-bar and the direction of the thrust.

Instead of using an auxiliary pawl to sup-

port the locking pawl in uncoupling position, I may dispense with the said auxiliary pawl and effect the support of the locking pawl by supporting the latter at a point at one side of its center of gravity, such as in front of the same, as shown in Figs. 8 and 10. This construction causes the lower end of the pawl, or locking piece, to throw forward and over the adjacent portion of the knuckle, when the locking device is raised to uncoupling position. The knuckle in swinging outward, will still support the locking device on the rearward end thereof, but when the knuckle is thrown to its inner position again, the locking piece will slip off from the knuckle and into the place provided for it between the wall of the draw-head and the knuckle. The action of the locking piece by this method of eccentric hanging, is the same whether the piece be pivoted to the sliding piece G, or directly pivoted to the supporting chain or connection, as in Fig. 10. The knuckle supports the main pawl as shown in Fig. 1, in its extreme outward position, even when the auxiliary pawl is used, the latter being used in one form, to support the locking pawl when first raised.

In Fig. 8, the housing of the draw-head is recessed, so as to engage with the rear end of the pawl and effect this eccentric action thereof, or throwing forward to rest upon the knuckle portion adjacent. I wish it to be understood as laying broad claim to this eccentric hanging of the locking device, and the means whereby this forward, or eccentric action is produced.

While I have shown the eccentric arrangement and the shoulder to throw the locking piece forward as united in one structure, it is obvious that the said piece can be thrown forward by the means disclosed, although the locking piece be not eccentrically hung,—a mere projection or surface of such piece being arranged to come in contact with a fixed part or surface to deflect it forward.

Having thus fully described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a car-coupler, the combination with a draw-head and a knuckle pivoted therein, of a wheel supporting said knuckle and mounted in one member, the other member having an inclined path for the travel of said wheel, the inclined face of the path being away from the direction of the coupling strain, whereby the strain on the wheel is removed, substantially as described.

2. In a car-coupler, the combination with a draw-head and a knuckle pivoted therein, of a wheel adapted to support said knuckle and mounted in one member, an inclined ledge on the other member affording a path for said wheel, the said ledge being open at the outside and shielded by a web from the other member, the inclination of the ledge being away from the line of thrust when the parts are coupled.

3. In a car-coupler, the combination with a head and a knuckle pivoted therein, of a wheel mounted in said knuckle and traveling on the inclined ledge in said head, the incline being located at the outer side of the knuckle-pivot from the center of the head, whereby the wheel when in the coupled position is relieved of any thrust on the knuckle.

4. In a coupler, the combination with a draw head and a knuckle pivoted therein, of a wheel supporting said knuckle and traveling on an inclined ledge in the head, the axis of the wheel in the coupled position being substantially parallel to the axis of the draw-bar, substantially as and for the purpose described.

5. In a car-coupler, the combination with a coupling-pin, of a knuckle or draw-head provided with a hole for said pin, the inner wall of said pin-hole having an inclined notch or recess adapted to support the pin, substantially as and for the purpose set forth.

6. In a car-coupler, the combination with a coupling pin, of a knuckle or draw-head having a pin-hole provided with a shoulder or recess to support said pin, the bearing face of said shoulder or recess being inclined or twisted, substantially as shown and described, whereby a rotary motion is given to the supported coupling-pin in the act of coupling.

7. In a car-coupler, the herein described inclined notch or shoulder formed in the pin hole of a draw head or knuckle adapted to support the coupling pin mounted thereon, substantially as and for the purpose described.

8. In a car-coupler, the combination with a draw-head and a knuckle pivoted therein, of a locking pawl or piece pivoted eccentrically on a vertically movable axis, and thus adapted to rest on said knuckle when raised to uncoupling position.

9. In a car-coupler, the combination with a draw-head and a knuckle pivoted therein, of a locking pawl and a vertically sliding piece pivotally connected to said pawl and mounted in the head, the said head being recessed or slotted to allow of raising said pawl to free said knuckle and effect an eccentric action of said pawl to engage with said knuckle.

10. In a car coupler, the combination with a draw-head and a knuckle pivoted therein, of a locking pawl and an auxiliary pawl, a sliding piece pivoted to said locking and auxiliary pawl and adapted to raise them vertically, the auxiliary pawl supporting said locking pawl by engagement with the knuckle till the knuckle swings open.

11. In a car coupler, the combination with a draw-head, and a knuckle pivoted therein, of a coupling pin for said head, and a locking device for said knuckle, and a compound lever for operating either said coupling pin or said locking device, consisting of a sleeve provided with lever extensions, and connected to one coupling device and a lever rod mounted within said sleeve and connected to the

other coupling device, whereby either device may be uncoupled independently.

12. In a car-coupler, the combination with a draw-head, a knuckle pivoted therein, and two independent coupling devices for said knuckle, of a compound lever attachment for uncoupling said devices, consisting of a tubular lever for operating one device, and a lever-rod mounted within said tubular lever for operating the other device.

13. In a car-coupler, the combination with a draw-head and a knuckle pivoted therein, of an automatic locking pawl for said knuckle, an operative lever therefor, and a second lever having a clamping attachment adapted to engage with a coupling pin, one lever being inclosed by the other lever, substantially as shown and described.

14. In a car-coupler, the combination with a draw-head and a knuckle pivoted therein, of a locking pawl and a vertically sliding piece pivoted to said pawl and mounted in the head, the said head being recessed to pro-

vide a housing for said pawl and adapted to act on one side of the pivot thereof when the pawl is near its upper limit, and thereby throw the said pawl forward to engage with the knuckle, for the purpose described.

15. In a car-coupler, the combination with a draw-head and a knuckle pivoted therein, of a locking pawl or piece mounted in a recess or housing in said draw-head, and means to raise said pawl or piece within said housing or recess, a surface or projection on said pawl being arranged to engage with the part of said head near the upper limit of its movement and thus throw the lower end of said pawl into engagement with the adjacent knuckle to maintain it temporarily in its raised position.

In testimony whereof I affix my signature in presence of two witnesses.

RODNEY F. LUDLOW.

Witnesses:

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F. B. ERNEST.