(No Model.) 4 Sheets—Sheet 1.

J. C. LOOK.

CAR COUPLING.

No. 494,067. Patented Mar. 21, 1893.

Fig 1

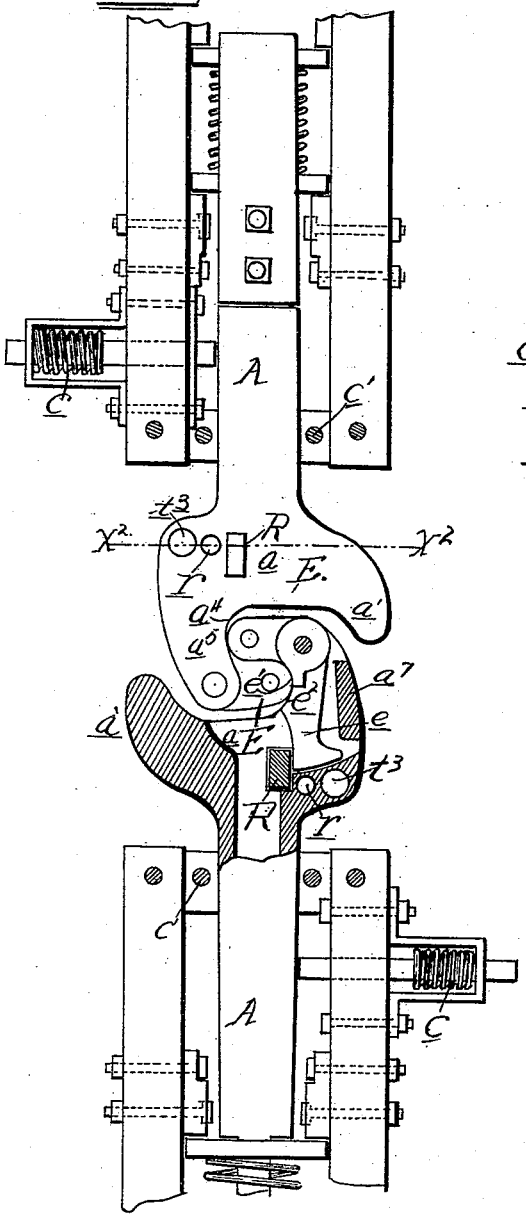
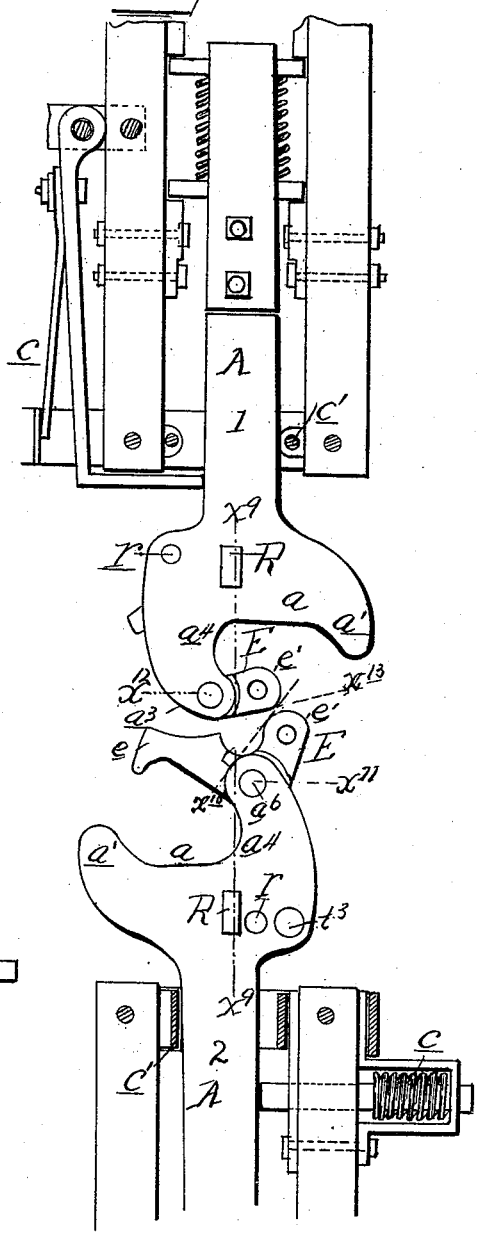


Fig 2



WITNESSES

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Harry Whitehouse

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John C. Look

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Attorneys

(No Model.) 4 Sheets—Sheet 2.

J. C. LOOK.

CAR COUPLING.

No. 494,067. Patented Mar. 21, 1893.

Fig 3.

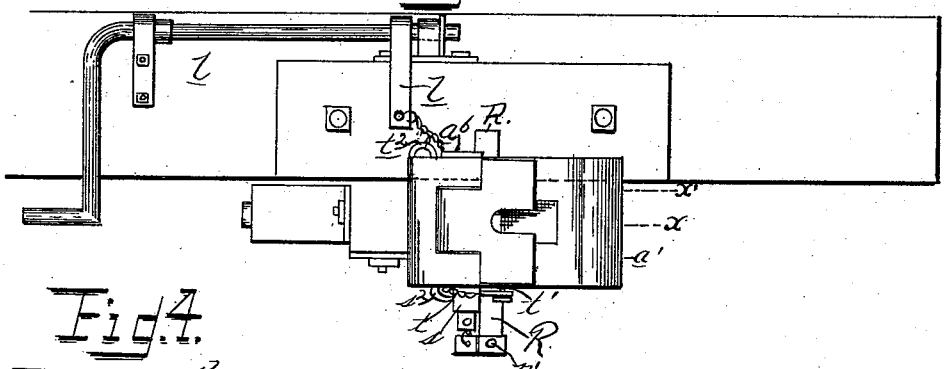


Fig 4.

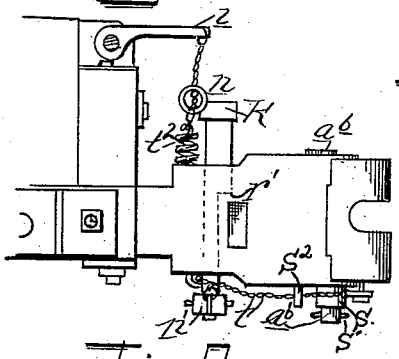


Fig 5.

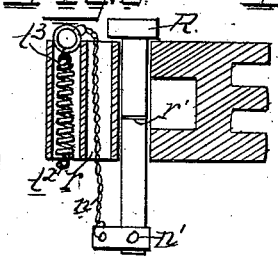


Fig 6.

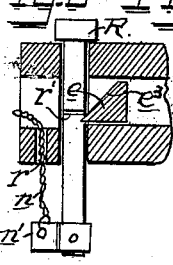


Fig 7.

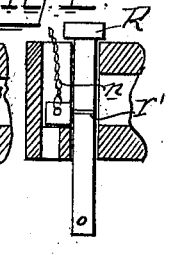


Fig 8.

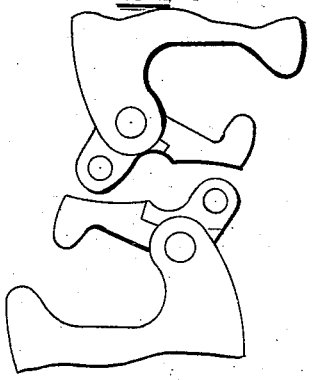


Fig 9.

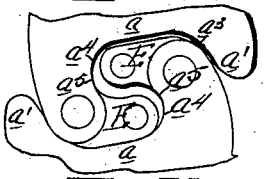


Fig 10.

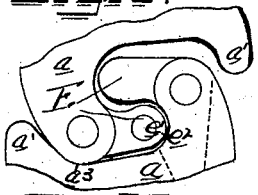


Fig 11.

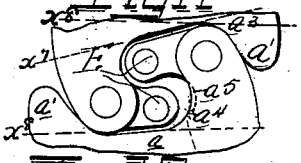


Fig 12.

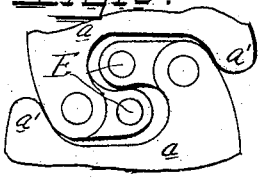
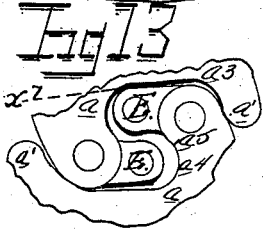


Fig 13.



WITNESSES

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(No Model.) 4 Sheets—Sheet 3.

J. C. LOOK.

CAR COUPLING.

No. 494,067. Patented Mar. 21, 1893.

Fig 4.

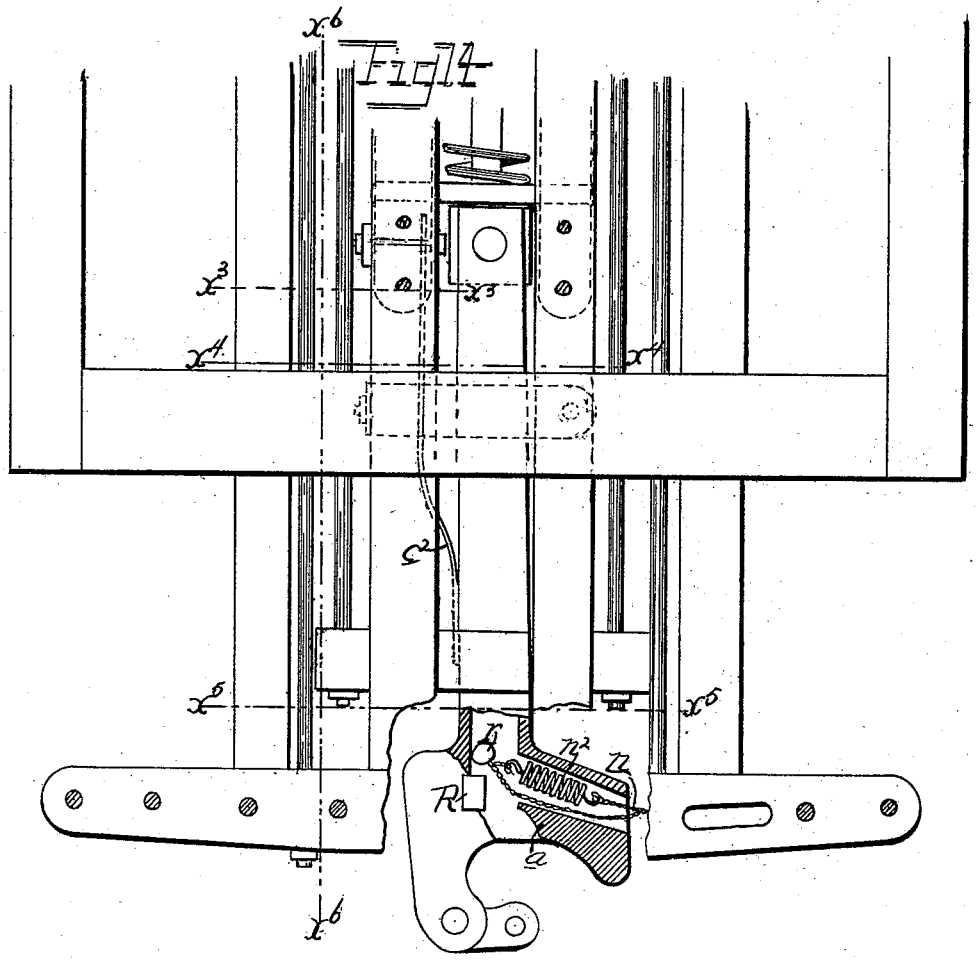


Fig 15.

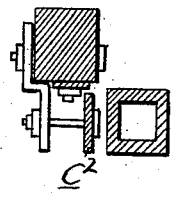


Fig 16

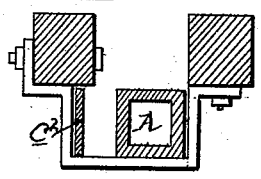
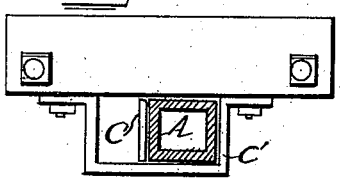


Fig 17.



WITNESSES

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(No Model.) 4 Sheets—Sheet 4.

J. C. LOOK.

CAR COUPLING.

No. 494,067. Patented Mar. 21, 1893.

Fig. 18

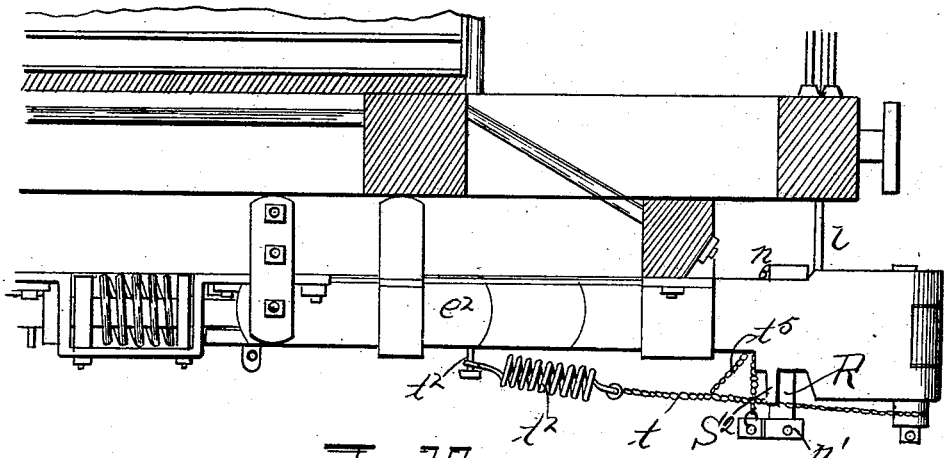
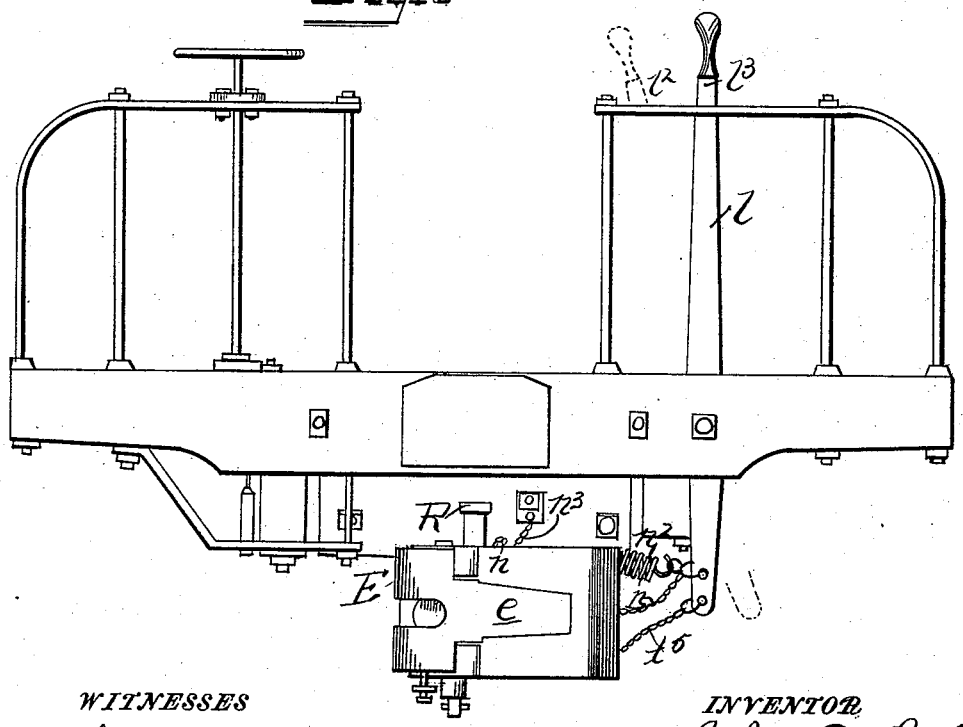


Fig. 19



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UNITED STATES PATENT OFFICE.

JOHN C. LOOK, OF SAN JOSÉ, CALIFORNIA.

CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 494,067, dated March 21, 1893.

Application filed August 12, 1892. Serial No. 442,927. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. LOOK, a citizen of the United States, residing at San José, county of Santa Clara, 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 the vertical hook type of coupler having a flat face pivoted hook-head with a buffer arm, and guard integral with the draw-bar.

It consists in a buffer arm, the face of which is flat, or at right angles to the line of the draw-bar in order to meet the opposing flat face hook-head, and prevent the breaking of the hooks.

It consists also in other devices, combinations and arrangements hereinafter fully described and specifically pointed out in the claims, whereby the flat face buffer arm can be effectively used, and other results obtained in connection with such arrangements. One of such other results is the turning of the pivoted hook-head in the coupling operation by lateral force instead of longitudinal impact. Another of such results is the forcing of the hooks into each other in drawing, and thereby getting the full strength of the hook, instead of allowing them to assume their positions voluntarily.

The invention further consists in a novel chain and spring connection between the pivoted hook-head, commonly called the "knuckle," and the unlocking lever, whereby the knuckle is thrown open when the lever is set uncoupled and the cars are separated.

The invention further consists in means for raising the locking pin from the lower end, and obtaining a flexible connection in any direction from the draw-bar.

In the drawings,—Figure 1 is a top view of two couplers coupled together, the drawhead of one being in section on line x—x of Fig. 3, and the timbers of the car being removed on line x'—x' of Fig. 3. Fig. 2 is a similar view to Fig. 1, the couplers being separated, and one being open. Fig. 3 is a front elevation, with the unlocking lever shown on the car. Fig. 4 is a side elevation of the coupler, the knuckle being open. Fig. 5 is a sectional view taken on line x^2—x^2 of Fig. 1. Fig. 6 is a modified draw-bar taken on the same line as Fig. 5. Fig. 7 is another modified draw-bar taken on the same line as Fig. 5. Fig. 8 is a skeleton or diagrammatic view showing two couplers coming together, both being open. Fig. 9 shows two couplers in buffing contact. Fig. 10 shows two couplers buffing on a curve. Fig. 11 shows two couplers buffing, one having a flat face buffer arm and an inclined knuckle, and the other an inclined buffer arm. Fig. 12 shows couplers drawing when side shifting has thrown the hooks out of line. Fig. 13 shows two couplers buffing, one having an inclined buffer arm, and one a square-faced buffer arm. Fig. 14 is a top view of the coupler as applied to the passenger car with the "Miller platform." Figs. 15, 16 and 17 are sections of the draft timbers and draw-bar and side spring, taken on lines x^3—x^3, x^4—x^4, and x^5—x^5, respectively, of Fig. 14. Fig. 18 is a section of a passenger car coupling, taken on line x^6—x^6 of Fig. 14. Fig. 19 is a front view of a passenger car platform buffer and coupler.

A is the draw-bar, a is its buffer arm, a' is the guard arm. E is the knuckle and e is the locking lever arm of the knuckle. R is the locking pin. These parts are all preferably made in cast metal, and of such dimensions as to work with other couplers of this type. The departure from others of this type consists in the line of the buffing face of the buffer arm a. In others it is on an incline, as represented by the line x^7 in Figs. 11 and 13; but in my improved form it is made flat, or at right angles to the end of the car, as represented by the lines x^8—x^8 of Fig. 11. This flat face is made to correspond to the width of the head of the coupler, as seen in Fig. 9.

The difference in the value of the two buffing faces is shown in Figs. 9 and 13. In Fig. 13 the nose e' of the knuckle strikes the inclined face of the buffer arm, and the draw-bar at a^2 strikes the incline of the guard, thus forming a wedge, with the end of the draw-bar a^3, not touching the buffer arm. Whereas as seen in Fig. 9, the end of the draw-bar a^3 strikes the buffer arm a on a flat face. In connection with the flat face buffer arm it is necessary to have a short incline a^4 between the instep a^5 of the hook-head and the buffer arm, and similar to this incline in the draw-

bar is an incline e^2 in the locking lever arm of the knuckle E. This incline is for the purpose of turning the hooks into place by lateral pressure, which causes the nose e' of one hook to impinge on the incline e^2 of the other hook. See Figs. 1 and 10. This lateral pressure, it will be observed, may be obtained by a spring on the draw-bar, as is seen in Fig. 1, or it may be by the guard, as is seen in Fig. 9, or it may be as represented in Fig. 10, where the lateral pressure is obtained from the flat face of the buffer arm which forms into an incline in respect to the opposite coupler head when buffing on a curve, or the guard may be so made as to fit up close to the back of the opposite coupler head on the curve as on the straight track.

The draw-bar is held in the car in any of the usual ways, and is held in position in regard to the center line of the car by a spring c and a stop c'. Any convenient way of applying the spring may be used. The spring is to act on the back of the draw-bar to force it over against the stop when the cars are separated, and to force the nose of one hook against the lever arm of the other when a coupling is being made, and to force the hooks in together in drawing. Where such springs are not used, the couplers often assume the position shown in Fig. 12, which wears the end of the knnckle without a corresponding wear on the instep of the knuckle, thereby causing the draft face of the knuckle to become flat, and leaving the hooks to take that position continually, thus weakening their draft strength. To obtain the benefit of the spring c to a fuller extent, the stop c' is so placed as to throw the greater part of the hook over beyond the middle line of the car, on the side on which the guard of the draw-bar lies. See Fig. 2.

The line x^9—x^9 represents the longitudinal middle plane of the car. This allows greater latitude for the draw-bars to follow each other when the cars are rocking or rounding curves. To effect the coupling of two couplers thus juxtaposed the knuckle E is made to turn outwardly to an angle beyond the plane of the draw-bar, so that the nose e' falls past the pivot pin a^6 in the draw-bar (see car 2 Fig. 2) thus forming an incline on line x^{10}. The knuckle is made to stop on its outward movement at that point, which makes the outward point of the incline positive. The hook-head of the opposite coupler, car 1, falls inside of this incline; the two couplers coming together, the nose e' of draw-bar 1 strikes the incline in draw-bar 2, while the end of the draw-bar at a^3 strikes the lever arm e which causes the knuckle to rotate and constantly change the incline, and force the draw-bars laterally in the direction of the lines x^{11} and x^{12} until the hooks have passed the pivot pin a^6, when they are forced into each other, as is represented in Fig. 1. The turning of the knuckle outward to form an incline is not only to work with a draw bar that is forced out of the middle plane of the car by a side spring, but any draw bar that has lateral play enough to allow it to lie out of the middle plane of the car; as said incline directs and forces in the opposite draw-head and puts it in line when it lies toward the hook side, and when it lies toward the guard side the guard is an incline that directs and forces it in from that side, thereby allowing an equal lateral play on either side, and allowing a greater lateral play on both sides than if said incline were not used.

The incline in the open knuckle may be assisted by allowing an incline to be formed in the closed knuckle, which is shown in draw-head 1 of Fig. 2 at x^{13}. This is accomplished by leaving a space between the lever arm e and the wall a^7 of the draw-bar. See Fig. 1. This receding knuckle is also of benefit in working with one having a long inclined buffer arm, as in Fig. 11, where it prevents the breaking of the knuckle that often happens in one represented in Fig. 13. Both knuckles may be left open, as in Fig. 8, and the coupling effected properly.

Novel means are shown for opening the knuckle E automatically. These consist in fastening the chain t to the knuckle at t' and passing it around the pivot pin a^6, which is extended down for that purpose, and has a collar s and cross pin s' to hold it properly. The chain then passes through a guide s^3 and backward to near the locking pin R, and then connects with a spring t^2. The spring is held in a tube t^3, extending upwardly. The upper end of the spring is fastened by a chain to the unlocking lever l, it being the same lever to which the chain from the locking pin R is connected.

The knuckle being set as coupled, the operation is as follows:—The lever l is raised up to raise the locking device, this movement tightens the spring t^2; when the locking device has passed the lever arm e of the knuckle, the action of the spring pulls on the chain t around the pivot pin a^6 thereby throwing the knuckle open. And in uncoupling when the cars are together, the spring t is tightened as before described, and the knuckle opens when the cars are separated. In buffing when the lever is up the knuckle turns in and out without further attention.

A means is shown of raising the vertical locking pin R. It consists in a chain n fastened to the lower end of the pin by a shackle n', and passing upwardly through a guide r in the draw-bar near the locking pin. See Figs. 5, 6 and 7. The object to be gained by this chain is to obtain a flexible connection from any part of the draw-bar and in any direction, while the pin moves vertically, it also being in a guide. In Fig. 7 the chain is not fastened to the lower end, but far enough down to obtain a flexible connection for as high as the pin is raised. Should the coupler become detached in any way from the car this chain will raise the pin automatically. When

the unlocking lever operates laterally a safety chain n^3 may be attached to the chain n and fastened to the car, as in Fig. 19. The shackle n', it will be observed, extends laterally from the pin and represents a suitable form of lateral extension, which extension may be increased sufficiently to permit the chain to rise without the necessity of any guide.

The locking pin R is of a usual pattern, being larger above than below, with a shoulder at r', see Figs. 4, 5 and 6, which is above the floor of the cavity of the draw-bar. The tail of the locking lever e has an incline e^3, see Fig. 6, which runs under the shoulder r' of the locking pin and raises it and passes back into place, letting the locking pin drop in front, as is seen in Fig. 1.

Figs. 14, 18 and 19 show the coupler as applied to a car with the Miller platform and buffer. With this platform the draw-bar is placed beneath the draft timbers, and a side spring c^2 is used which performs the same duty as the side spring c in Fig. 2. This spring c^2 is held longitudinally with the draw-bar in a well known way, as shown in Figs. 15, 16 and 17, which are sectional parts of the draft rigging taken on lines x^3, x^4 and x^5 respectively, of Fig. 14. In this platform coupler the unlocking lever l' is placed on the opposite side from that on the car shown in Fig. 3, and requires the chain n to pass laterally from the draw-bar.

In Fig. 14 the uncoupling chain n comes up into the draw-bar and passes out through the buffer arm a, and in Figs. 18 and 19 it is shown to pass up through the draw-bar and then laterally to the lever l'.

In Figs. 14 and 19 a spring n^2 is shown in connection with the unlocking chain n. The connection n is to raise the pin R, and the spring n^2 to hold it up. This is necessitated by the compression action of the coupler and buffer in the passenger car requiring a firm connection for raising the pin R, which is done by the chain; the spring at that time is stretched out to the same length as the chain; the lever l' in that operation would be as marked at l^2 then the lever would go back into the catch at l^3 and the spring n^2 hold up the pin. The spring n^2 can be dispensed with where there is space enough between the draw-bar and platform to let the pin rise higher, to take up the lateral play of the draw-bar in buffing, after it is uncoupled.

In Figs. 18 and 19, the chain t from the knuckle, and the spring t^2 are somewhat modified in arrangement from those shown in Figs. 3 and 4. In this case the spring t^2 is fastened to the draw-bar underneath at t^4, and a cross chain t^5 connects the chain t with the lever l'. When the lever l' is operated the spring and chain t and t^2 are tightened, and the operation takes place as before described.

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

1. In a car coupling, the combination of a draw-bar having a buffer-arm and guard, and a flat-face pivoted hook-head with lever-arm, the pivot center of said hook-head being so located that the end of the draw-bar in connection with the hook-head forms the buffing face, said hook-head being adapted to turn outwardly to a fixed angle beyond the longitudinal plane of the draw-bar forming an incline inwardly in the direction of the central plane of the draw-bar, and a locking device to engage the said lever arm, substantially as herein described.

2. In a car coupling, the combination of a draw-bar having a flat-face buffer-arm and guard integral therewith, a flat-face pivoted hook-head with rearwardly extending locking lever-arm, a locking device engaging said arm, an incline a^4 in the draw-bar extending rearwardly of the instep a^5 occupied by the opposite hook in drawing, the said instep being rearwardly of the pivotal center of the hook-head, and a similar incline e^2 in the lever arm of the hook-head, whereby by the lateral contact of the opposing hook-head said lever-arm is forced laterally to bring its incline flush with that in the draw-bar, thereby swinging its hook-head to engagement substantially as herein described.

3. In a car coupling, the combination of a laterally movable draw-bar, a flat-face pivoted hook-head with lever arm carried by the draw-bar, and adapted to turn outwardly to a fixed angle beyond the longitudinal plane of the draw-bar to form an incline inwardly toward the central plane of the draw-bar, said lateral movement of the draw-bar being such as to allow said draw-bar to lie with the greater part of the hook beyond the center line of the car, substantially as herein described.

4. In a car coupling, the combination of a laterally movable draw-bar having a buffer-arm and guard, a flat-face pivoted hook-head with lever arm carried by the draw-bar and adapted to turn outwardly to a fixed angle beyond the longitudinal plane of the draw-bar to form an incline in the direction of the guard, and to turn inwardly to form an incline in the direction of the guard, and said lateral movement of the draw-bar being such as to allow said draw-bar to lie with the greater part of the hook beyond the center line of the car, substantially as herein described.

5. In a car coupling, the combination of a laterally movable draw-bar having a flat face pivoted hook-head with lever arm, an incline in said lever arm and draw-bar rearwardly of the pivotal center of the hook-head, and a spring on the draw-bar to force it laterally toward the opposite draw-bar to impinge the hooks on said inclines, substantially as herein described.

6. In a car coupling, the combination of a laterally movable draw-bar, a flat face pivoted hook-head carried by the draw-bar and adapted to turn outwardly beyond the center

line of the car and to an angle beyond the plane of said draw-bar, said hook-head having a lever arm against which the opposing hook impinges, and a spring acting on the draw-bar whereby it is pressed over and held in such a position that the greater part of the hook-head lies beyond the center line of the car when the cars are separated, substantially as herein described.

7. In a car coupling, the combination of a laterally movable draw-bar having a guard and a flat face buffer arm, a flat face pivoted hook-head carried by the draw-bar and having a lever arm, said draw-bar and lever arm having an incline toward the buffer arm, and a spring on the draw-bar to force it laterally toward the opposite draw-bar, to cause the hooks to impinge on the incline as the draw-bar head strikes the buffer arm, substantially as herein described.

8. In a car coupling, the combination of a laterally movable draw-bar, a flat face pivoted hook-head carried thereby and having a lever arm, said hook-head being adapted to turn outwardly to an angle beyond the plane of the draw-bar, to form an incline, and to turn inwardly to form an incline, and a spring acting on the draw-bar to force it over and hold the greater part of the hook-head past the center line of the car when the cars are separated, substantially as herein described.

9. In a car coupling, the combination of a draw-bar having a pivoted knuckle, the pivotal pin of said knuckle extending below the draw-bar, and a chain fastened beneath or to the lower part of the knuckle, said chain passing around the extended pin and rearwardly through a guide, and a means for operating said chain to open the knuckle, substantially as herein described.

10. In a car coupling, the combination of a draw-bar having a pivoted knuckle with a locking device therefor, a lever connection for operating said locking device, and the chain t and spring t^2 for opening the knuckle, said chain being connected with the lever for operating the locking device, substantially as herein described.

11. In a car coupling, the combination of the vertically movable locking pin R, a lifting chain fastened to its lower part and passing upwardly through a guide in the draw-bar, and a means for lifting said chain whereby a flexible connection is obtained from the draw-bar while the pin moves vertically, substantially as herein described.

12. In a car coupling, the combination of a gravity locking pin extending through the draw-bar, a chain attached to said locking pin beneath the draw-bar, and passing upwardly through a guide in the draw-bar and a means above whereby said locking pin is raised, substantially as herein described.

13. In a car coupling, the combination of a locking pin extending through the draw-bar, said pin having a lateral extension at its lower portion and a chain fastened to said extension and connected with means above whereby said locking pin is raised, substantially as herein described.

In witness whereof I have hereunto set my hand.

JOHN C. LOOK.

Witnesses:
S. H. NOURSE,
J. A. BAYLESS.