(No Model.) 3 Sheets—Sheet 1.

E. N. GIFFORD.

CAR COUPLING.

No. 457,154. Patented Aug. 4, 1891.

Fig. 1.

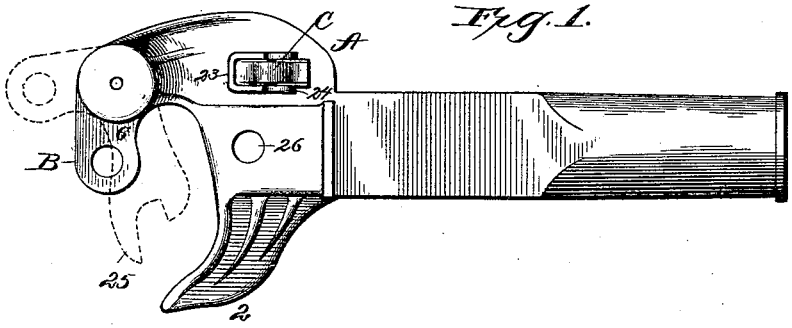


Fig. 2.

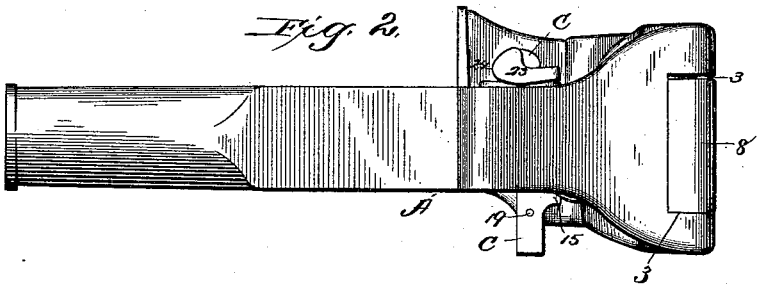


Fig. 3.

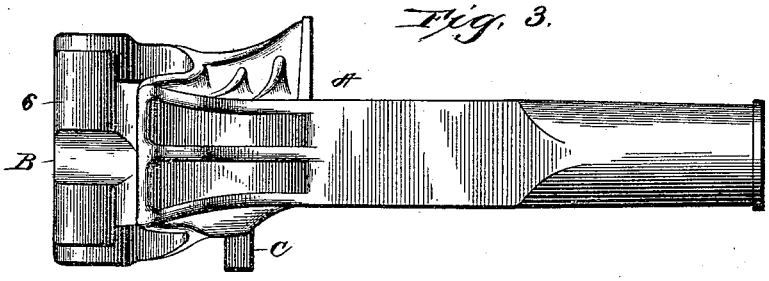
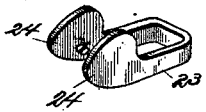


Fig. 10.



Witnesses:

Wm. M. Sheem.

E. Wurdemann.

Inventor.

Ezra N. Gifford

By Lotz & Kennedy

Attys.

(No Model.) 3 Sheets—Sheet 2.

E. N. GIFFORD.

CAR COUPLING.

No. 457,154. Patented Aug. 4, 1891.

Fig. 4.

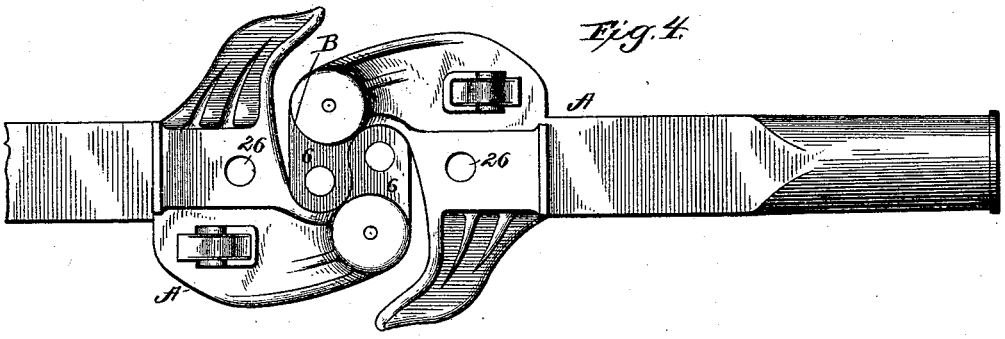


Fig. 5.

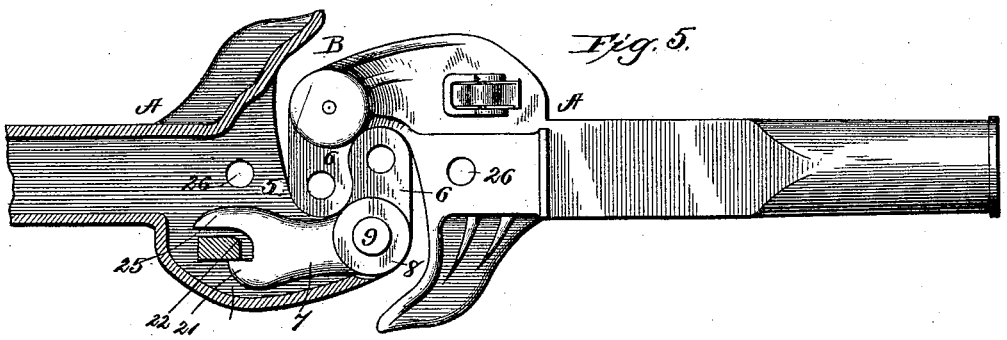


Fig. 6.

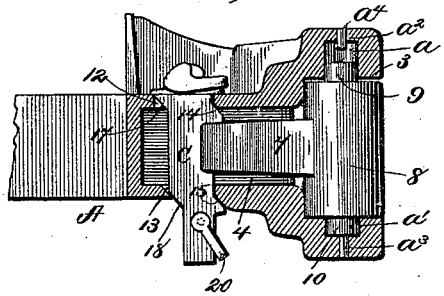


Fig. 7.

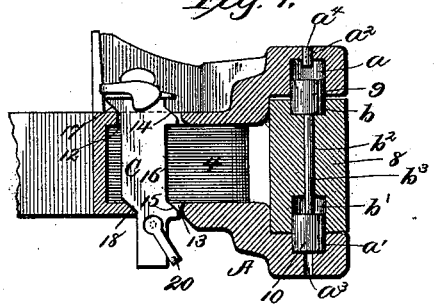


Fig. 8.

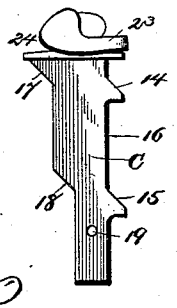
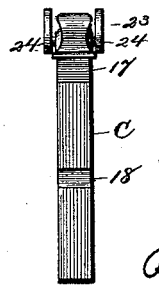


Fig. 9



Witnesses:

Wm. M. Sheem.

E. C. Hardeman

Inventor:

Egra N. Gifford

By Fitz & Kennedy.

Attys

(No Model.) 3 Sheets—Sheet 3.

E. N. GIFFORD.

CAR COUPLING.

No. 457,154. Patented Aug. 4, 1891.

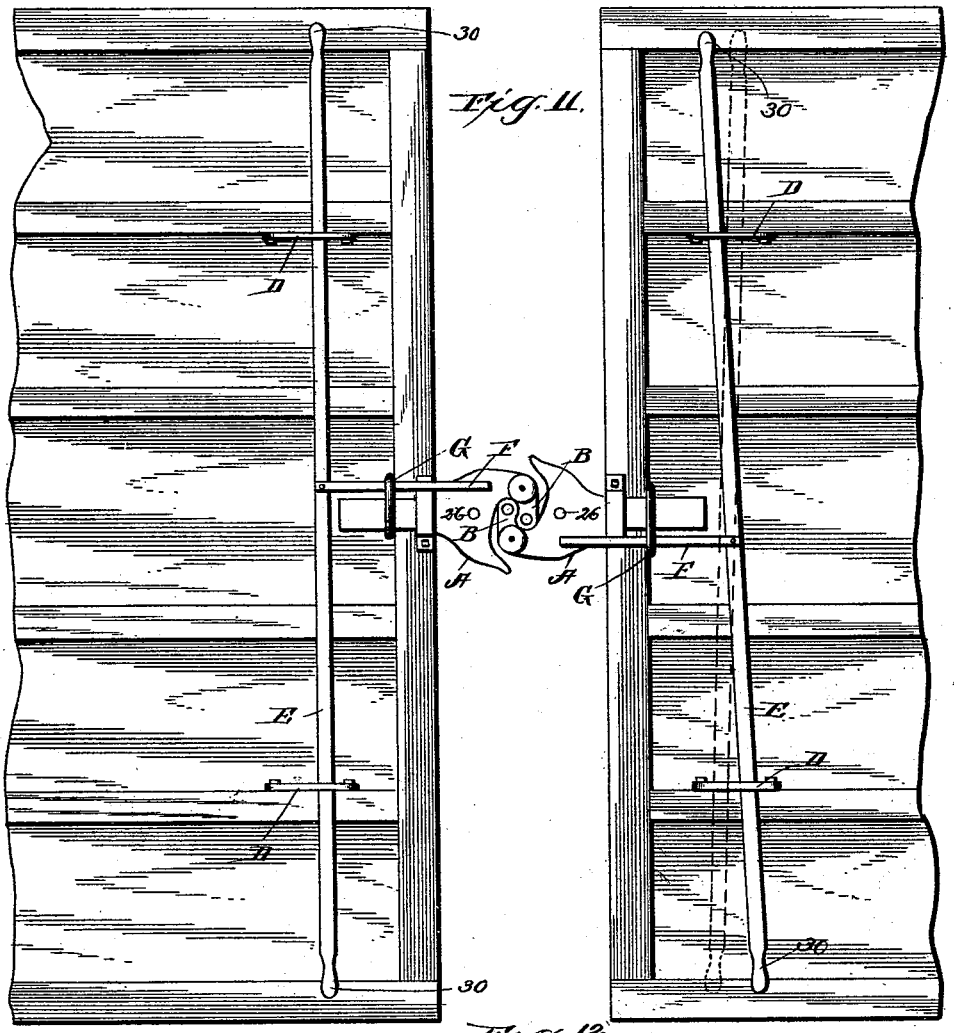
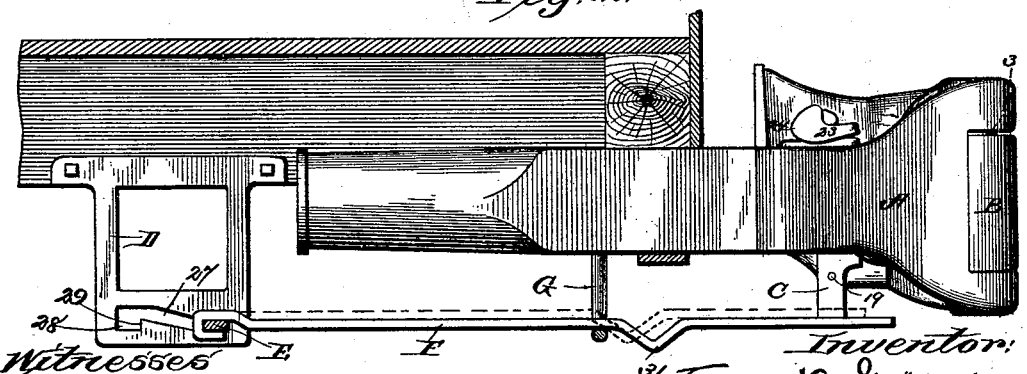


Fig. 12.



Witnesses
Wm. M. Rheem.
E. C. Hazelman

Inventor:
Ezra N. Gifford
By Lotz & Kennedy.
Attys

UNITED STATES PATENT OFFICE.

EZRA N. GIFFORD, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE COLUMBIA CAR COUPLER COMPANY, OF SAME PLACE.

CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 457,154, dated August 4, 1891.

Application filed March 2, 1891. Serial No. 383,365. (No model.)

To all whom it may concern:

Be it known that I, EZRA N. GIFFORD, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, 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.

This invention relates to car-couplers of the class in which the swinging hooks of two approaching coupling-heads will automatically engage each other and will then be automatically locked in the mutually-grasping positions without the use of any springs or small or weak parts for such purpose.

The invention relates more particularly to certain improvements on the car-couplers shown in United States Patents Nos. 434,865 and 444,697, granted August 19, 1890, and January 13, 1891, respectively.

The objects of this invention are to provide a coupling-head of increased strength; to provide a stronger and more effective pivotal connection between the coupling-head and coupling-hooks; to provide a coupling-hook having a locking-arm of greater strength, so constructed that the coupling action will be positive, so that the coupling-arms of the two couplers will engage each other in their locked positions without contact with the draw-head; to provide a coupling-pin of novel construction, and to provide for the general utility of the car-coupler, combining simplicity and durability of construction with efficiency of operation.

To the foregoing and other useful ends my invention consists in the features of construction and combinations of parts hereinafter fully described, and pointed out in the appended claims.

In the accompanying drawings, illustrating my invention, Figure 1 is a top plan view of a coupler constructed in accordance with my invention. Figs. 2 and 3 are side elevations taken from opposite sides. Fig. 4 is a plan view showing two couplers locked in engagement with each other. Fig. 5 is a similar view with one of the couplers in horizontal section. Figs. 6 and 7 are vertical sections of the draw-head, showing the coupling-hook and coupling-pin in different positions. Figs. 8 and 9 are side elevations of the coupling-pin. Fig. 10 is a perspective view of the cam carried by the coupling-pin. Fig. 11 is a bottom plan view of the ends of two cars provided with couplers constructed in accordance with my invention, and Fig. 12 is a vertical longitudinal section through the end of the car and showing the coupler and devices for operating its coupling-pin.

Referring to said drawings, A A′ indicate the draw-heads upon the meeting ends of two cars. The construction of said draw-heads being similar, a detailed description of one will suffice. The said draw-head is provided with a longitudinally-arranged jaw 1 and a substantially transversely-arranged jaw 2. The end portion of said arm 1 is bifurcated, as shown at 3 in Fig. 2, and is recessed or provided with a cavity 4, which communicates with the cavity 5 in the draw-head.

B indicates a coupling-hook comprising a coupling-arm 6 and a locking-arm 7. The said coupling and locking arms 6 and 7 project at about right angles from a cylindric hub 8, which fits within the bifurcated end portion 3 of the jaw 1, Figs. 2, 6, and 7. The said hub 8 in its upper and lower ends is provided centrally with sockets *b* and *b′*, which register with the sockets *a* and *a′* in the bifurcated end portion 3 of the jaw 1. Studs or pivots 9 and 10 are located, respectively, in the said sockets. The said socket *a* in the upper end of the jaw and the socket *b′* in the lower end portion of the hub correspond in length with the studs, so that when said studs are located in their respective upper sockets *a* and *b′* the coupling-hook is free to be removed from said jaw 1. The lower end of sockets *b* and *a′* are shorter than the studs, so that when the studs rest in said sockets *b* and *a′* they will also project above the same and partially into the sockets *a* and *b′*, thereby forming a pivotal connection between the coupling-hook and the jaw 1. This pivotal connection is of great value, and is advantageous for several reasons, among which may be noted the increased strength of the jaw 1, the coupling-hook, and the pivot pin or pins, and the slight lateral movement or wabbling motion of which the coupling-hook is capable

incident to a pivotal connection of this kind. To permit said coupling-hook to be removed from the jaw, apertures a^2 and a^3 are made in the bifurcated end portions of the jaw, and which register with each other and with an aperture b^2 in the hub. The said apertures are contracted, so as not to weaken said parts, and a small rod or pin b^3 is located within the aperture b^2. The said pin b^3 rests upon the stud 10, and the upper stud 9 rests upon the upper end of said pin, as shown in Fig. 7. The upper aperture a^2 is closed by a suitable plug or screw a^4. By inserting a suitable instrument in the lower aperture a^3 and pressing upwardly upon the stud 10 the latter will be raised up into the socket b' and by means of the pin b^3 will raise the stud into the socket a, whereupon said coupling-hook can be removed. The plug a^4, which projects down into the socket a, prevents the accumulation of foreign matter in the socket, and also prevents the studs from accidentally rising to the tops of the sockets. Said plug is removed by hand or by pressure exerted thereon in driving the stud into the upper sockets. The coupling-arm 7 of the hook B is free to swing from a transverse position to a longitudinal position within the cavity 5 of draw-head behind the cavity 4 of the jaw 1. This locking-arm stands nearly at right angles to the coupling-arm, so that when two of the couplers come together and one of the hooks is in the position shown in dotted lines in Fig. 1 the coupling-arm of the other hook, which is in the positon shown in full lines in Fig. 1, will engage the locking-arm of the former and will swing it on its pivot in the position shown in Fig. 5 to engage the locking-pin C. The end portions of the locking-pin C are preferably rectangular in cross-section, and said pin is flat on its plain sides and is provided with a head 11, that serves to limit the downward movement of said pin within the slots 12 and 13 in the draw-head. The slots are located so that when the locking-pin stands within the same said pin will be in the path of the locking-arm 7 of the coupling-hook. The front face of said pin is provided with angular and parallel shoulders or parallel inclined edges 14 and 15, located, respectively, at the upper and lower end portions of the said pin. Between said inclined edges and in the rear of the foremost edges or faces of the locking-pin said pin has an upright bearing-edge 16, with which the locking-arm engages. The rear face of said locking-pin is provided at its upper and lower end portions with angular and parallel shoulders or parallel inclined edges 17 and 18, that are also parallel with the inclined edges 14 and 15. The lower end of the pin has parallel edges and is provided with an opening or slot 19 for a split key 20, that serves to limit the upward movement of the locking-pin. The length of the upper slot 12 is equal to the width of the pin just below the head 11, and the front edge of said slot is chamfered downwardly corresponding to the inclined edge 14 of the pin. The length of the lower slot 13 is equal to the width of the body portion of the pin, and its front and rear edges are chamfered downwardly to an angle coinciding with the angle of the inclined edges 15 and 18 of the pin. The said pin is capable of a limited upward and rearward movement, and vice versa, within the said slots, and in so moving the said inclined edges ride over the chamfered portions of said slots. The end of the locking-arm is vertically flat and is rounded on one side of its end portion 21, that comes in contact with the locking-pin, which is chamfered at its point of contact with the locking-arm. It will be noted that by locating the bearing-edge 16 of the pin in the rear of the foremost edges or faces of said pin it is possible to arrange the locking-pin nearer the forward end portion of the draw-head, and thereby shorten the locking-arm, which serves to make the same stronger.

To the head of the locking-pin is pivoted a bail 23, having the cam-shoulders 24 resting upon the top of the draw-head. The lowest part of the cam-shoulders are shown resting upon the upper face of the draw-head in Fig. 6, while in Fig. 7 the cam-shoulders are shown with their highest parts in engagement with the draw-head and the locking-pin located at the upper limit of its movement.

As a further and separate improvement I provide the locking-arm with an offset or shoulder 25, which is located on its rear face and extends longitudinally beyond the end of said locking-arm. As shown in dotted lines in Fig. 1, when the locking-arm stands transversely to the length of the draw-head this offset or shoulder 25 extends in the direction of and adjacent to the end of the jaw 2 of the draw-head and serves to prevent the coupling-arm of the hook from getting in behind the locking-arm, since the distance between the end of the offset 25 and the jaw 2 is less than the width of the coupling-arm 6. This offset or shoulder 25 serves the further purpose of so turning the hook on its pivot that the coupling-arm of one draw-head will not strike the face of the other draw-head as they come together in coupling, by reason of the point of contact between the coupling-arm and the offset or shoulder being so located that the coupling-arm of one draw-head will turn around the coupling-arm of the other and assume the position shown in Figs. 4 and 5 without coming in contact with the end of said draw-head.

In case the locking-pin should be broken or lost, I have provided the openings 26, located in the draw-head in the rear of the locking-arm 7 when the latter is in the position shown in Fig. 5. By placing an ordinary coupling-pin within the said opening the hook will be held in its locked or closed position.

For coupling and uncoupling from either

side of the cars without stepping or reaching between the same my device is so arranged that it will not be affected or interfered with by the longitudinal movements of the draw-head in its guideways between the sills of the carriage as occasioned by the impact or irregular strains that a draw-head is subjected to. For this purpose I secure to the sills of the car-body two hangers D at proper distances apart, each with a slot 27, inclined from the front toward the rear, where it leads into a recess 28, forming a shoulder 29. Through both these slots is placed a straight rectangular bar E, of a length nearly the width of the car-body and having handles 30. This bar may be swung from either end to move in the slot of the hanger D in that side, while the opposite hanger will provide the fulcrum. To the middle of this bar E is coupled so as to have a slight pivotal movement thereon one end of a bar F, with its opposite end extending forward under the locking-pin C. This bar F is supported at about its middle by a stirrup G, secured under the car-body, and just forward of this stirrup G the bar F is bent to form a downwardly-pointing V 31, so that on pulling said bar F rearward the included surface of its V portion will slide upon such stirrup, and thereby the forward end of the bar F will be raised and will lift the locking-pin C. Thus as long as the bar E has both ends in their forward position, as shown by full lines in Fig. 12, the forward end of the bar F will be depressed and allow the pin to remain at the lower limit of its movement, while by swinging either end of the bar E to rest in the recess 28 behind the shoulder 29 of one of the hangers D the bar F will be in the position shown in dotted lines in Fig. 12 and the locking-pin will be lifted to be held out of engagement with the locking-arm of the coupling-hook. After thus being uncoupled and it is desired to release the locking-pin C the bar E only requires to be lifted out of the recess 28 and swung to its forward position, which can be accomplished from either side of the car in an obvious manner. It will be understood, of course, that when the locking-pin is being operated by the bar F the bail 23 is in the position shown in Fig. 6; but when it is desired that the car shall not under any circumstances be coupled to another car the bail is thrown over, as shown in Fig. 7, which will lift the locking-pin out of the path of the locking-arm 7. In case the mechanism for lifting the locking-pin from either side of the car should become out of order or broken, the pin can be operated by the bail and cam-shoulders. If a train of cars were standing and the operator wished to uncouple them at a certain point and leave before the cars separated, but have the car ready to automatically couple onto another car, by lifting a bail until its handle stands almost vertical the pin will be lifted enough to uncouple the cars, and when another car bumps against it the said bail and cam will be thrown forward by reason of the impact and allow the pin to fall.

I claim as my invention—

1. A car-coupler comprising a draw-head having a bifurcated jaw provided with sockets in the inner faces of said bifurcated portion, a coupling-hook having sockets in the ends of its hub, studs located in said socket, a connection between said studs, and means for elevating one of said studs.

2. A car-coupler comprising a draw-head having a bifurcated jaw provided with sockets in the inner faces of said bifurcated portion, a coupling-hook having sockets in the ends of its hub, studs located in said sockets, a connection between said studs, and an opening in the lower lug of said bifurcated portion communicating with the socket therein.

3. A car-coupler comprising a draw-head having a bifurcated jaw provided with sockets in the inner faces of said bifurcated portion, a coupling-hook having sockets in the ends of its hub, studs located in said sockets, a pin passing through said hub and abutting against the adjacent ends of said studs, and means for elevating the lower of said studs.

4. A car-coupler comprising a draw-head having a bifurcated jaw provided with sockets in the inner faces of said bifurcated portion, a coupling-hook having sockets in the ends of its hubs, studs located in said sockets, a connection between said studs, and a plug or pin projecting into the socket in the upper lug of said bifurcated portion.

5. A car-coupler comprising a draw-head having a bifurcated jaw provided with sockets in the inner faces of said bifurcated portion, a coupling-hook having sockets in the ends of its hub, studs located in said sockets, a connection between said studs, a removable plug or pin projecting into the socket in the upper lug of said bifurcated portion, and means for elevating one of said studs.

6. A car-coupler comprising a draw-head having a bifurcated jaw provided with sockets in the inner faces of said bifurcated portion, a coupling-hook having sockets in the ends of its hub, studs located in said sockets, a pin passing through said hub and abutting against the adjacent ends of said studs, an opening in the lower lug of said bifurcated portion communicating with the socket therein, and a removable plug or pin projecting through an opening in the upper lug of said bifurcated portion into the socket therein.

7. A car-coupler comprising a draw-head having a pivoted coupling-hook provided with a locking-arm adapted for engagement with a locking-pin, as described, an offset or shoulder on said locking-arm extending beyond the end thereof, and an opening in said draw-head for the insertion of an auxiliary coupling pin or bolt, said opening being so located that the said coupling-pin will be located in the path of said offset or shoulder.

8. A car-coupler comprising a draw-head,

a pivoted coupling-hook having a locking-arm, a locking-pin located in slots in said draw-head and in the path of the said locking-arm and provided with inclined edges to ride over the edges of said slots, and a bearing-edge on said pin for engagement with said locking-arm, said bearing-edge being located in the rear of the foremost edges or faces of said locking-pin.

9. A car-coupler comprising a draw-head, a pivoted coupling-hook having a locking-arm, a locking-pin located in slots in the draw-head and in the path of the said locking-arm and provided with inclined edges to ride over the edges of said slots, a plurality of said inclined edges being located on the front face of the locking-pin and parallel to each other, and a bearing-edge located between said inclined edges on the front face of the pin and in the rear of the foremost edges or faces of said locking-pin.

10. A car-coupler comprising a draw-head, a pivoted coupling-hook having a locking-arm, a locking-pin located in slots in said draw-head and in the path of said locking-arm and provided with upwardly-facing inclined edges to ride over the edges of said slots, and a bearing-edge on said pin for engagement with said locking-arm, said bearing-edge being located in the rear of the foremost edges or faces of said locking-pin.

11. A car-coupler comprising a draw-head, a pivoted coupling-hook having a locking-arm, a locking-pin located in slots in said draw-head and in the path of the said locking-arm and provided on both its front and rear faces with a plurality of inclined edges to ride over the edges of said slots, all of said inclined edges being located parallel to each other, and a bearing-edge located between said inclined edges on the front face of the pin and in the rear of the foremost edges or faces of said locking-pin.

12. A car-coupler comprising a draw-head, a pivoted coupling-hook having a locking-arm, and a locking-pin located in slots in said draw-head and provided with inclined shoulders projecting beyond the front or bearing edge thereof, for the purpose described.

13. A car-coupler comprising a draw-head, a pivoted coupling-hook having a locking-arm, and a locking-pin located in slots in said draw-head and provided with upwardly-facing inclined shoulders projecting beyond the front or bearing edge thereof, for the purpose described.

14. A car-coupler comprising a draw-head, a pivoted coupling-hook having a locking-arm, a locking-pin located in slots in said draw-heads, having chamfered edges, and parallel inclined shoulders upon said locking-pin, a plurality of said parallel shoulders projecting from the front edge of said locking-pin.

15. A car-coupler comprising a draw-head, coupling-hook, a locking-pin for engagement with a locking-arm of said coupling-hook, and a cam pivoted to the upper end of said locking-pin and having its cam portion resting upon the draw-head, said cam being so formed that by turning it to a position between the highest and lowest parts the locking-pin will be elevated, but the said cam will be thrown to its lowest position by the impact of two cars coming together, substantially as hereinbefore set forth, and for the purposes described.

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

EZRA N. GIFFORD.

Witnesses:
HARRY COBB KENNEDY,
OTTO LUEBKERT.