

No. 829,582.

PATENTED AUG. 28, 1906.

E. C. GAYER.  
AUTOMATIC COUPLING FOR RAILWAY AND OTHER VEHICLES.

APPLICATION FILED SEPT. 11, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

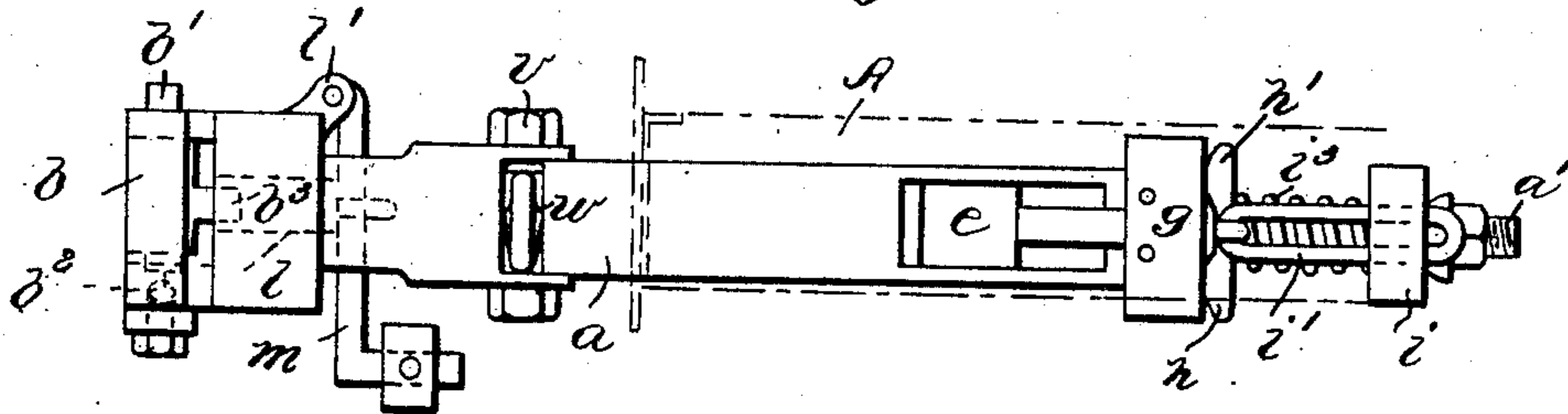


Fig. 2.

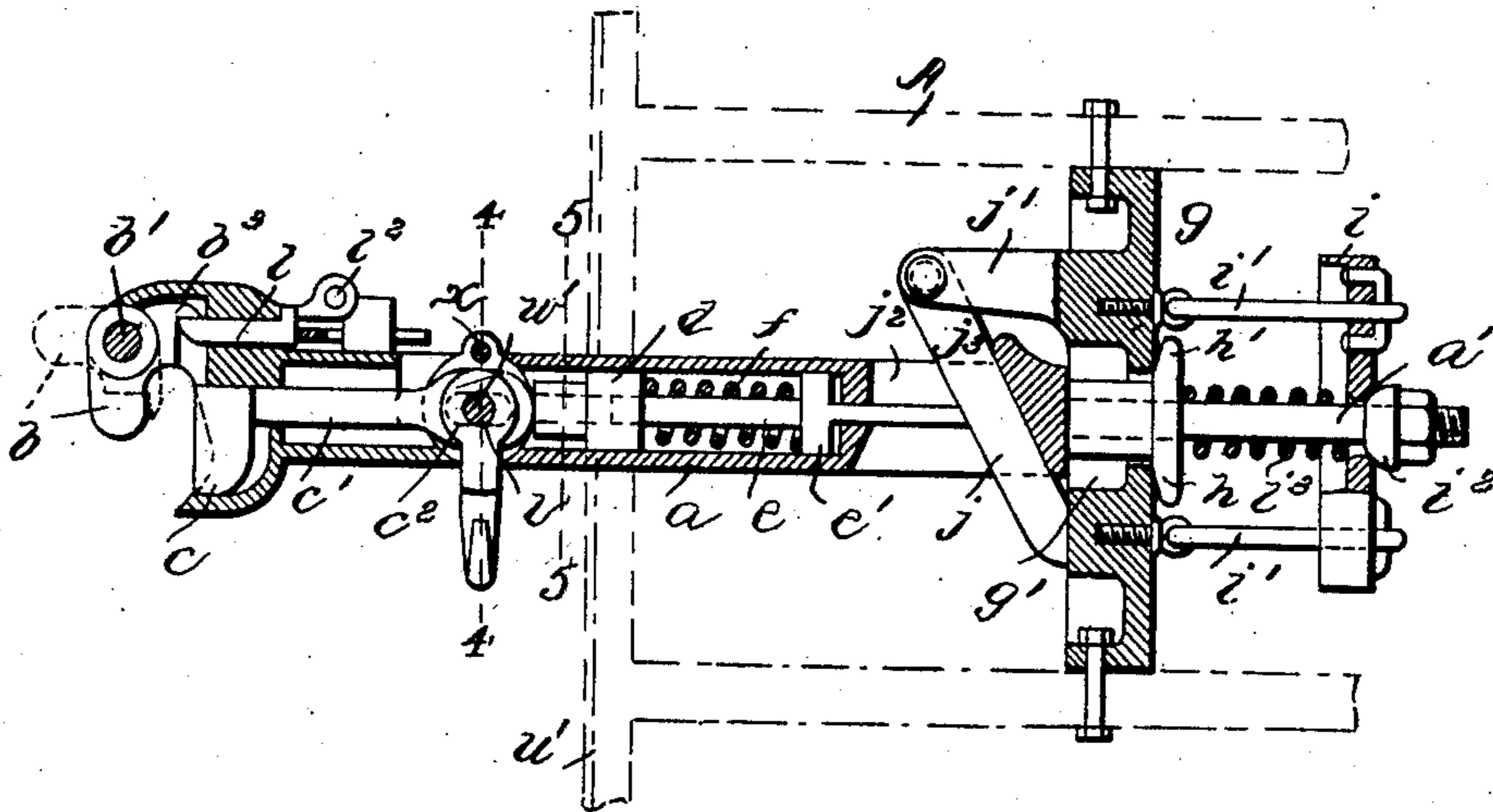


Fig. 3.

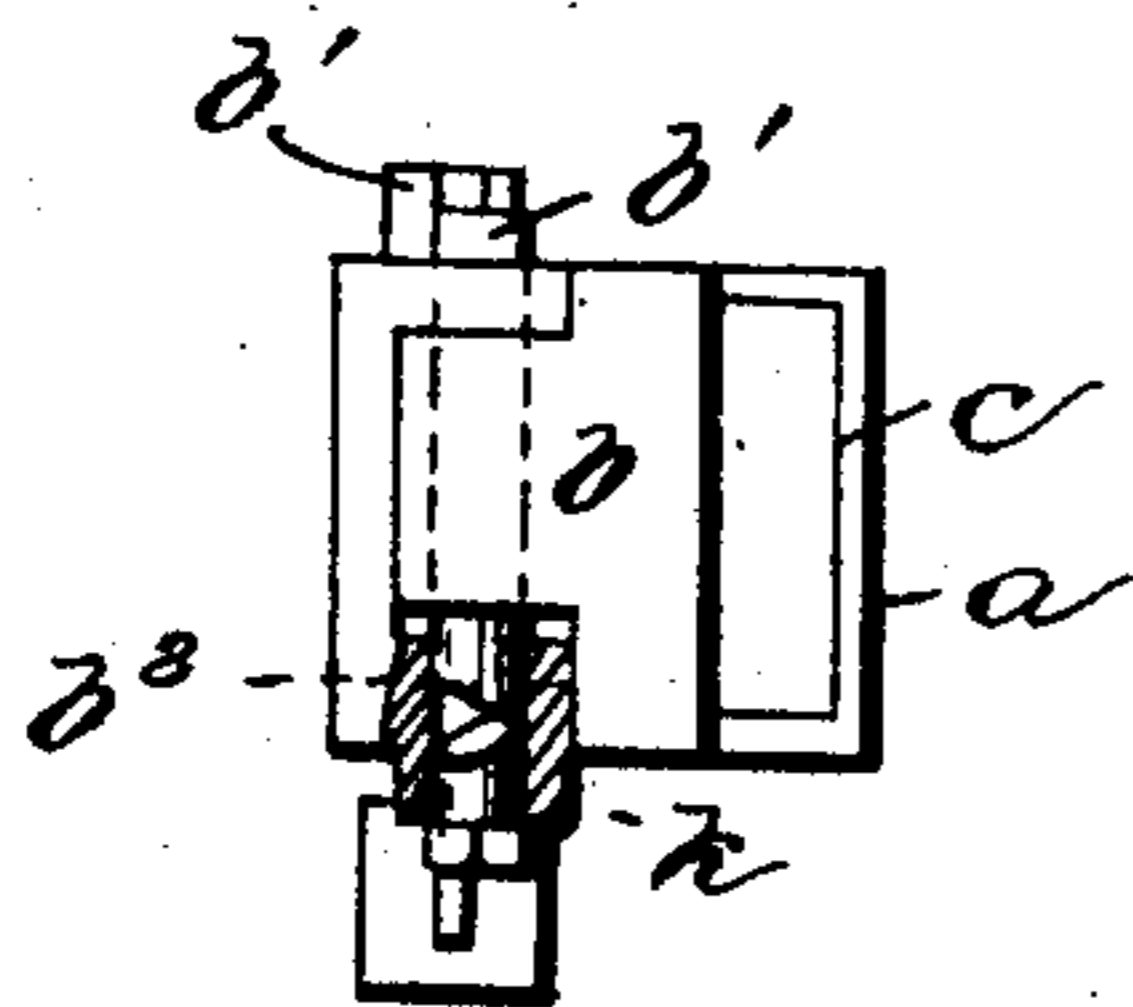


Fig. 4.

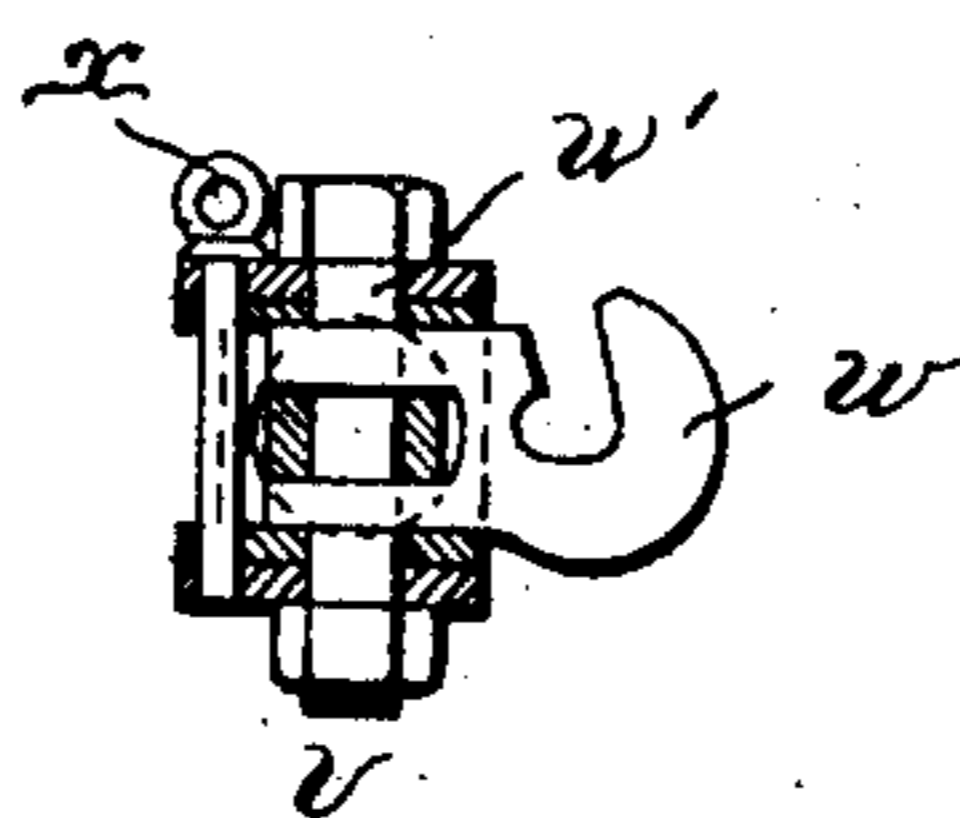
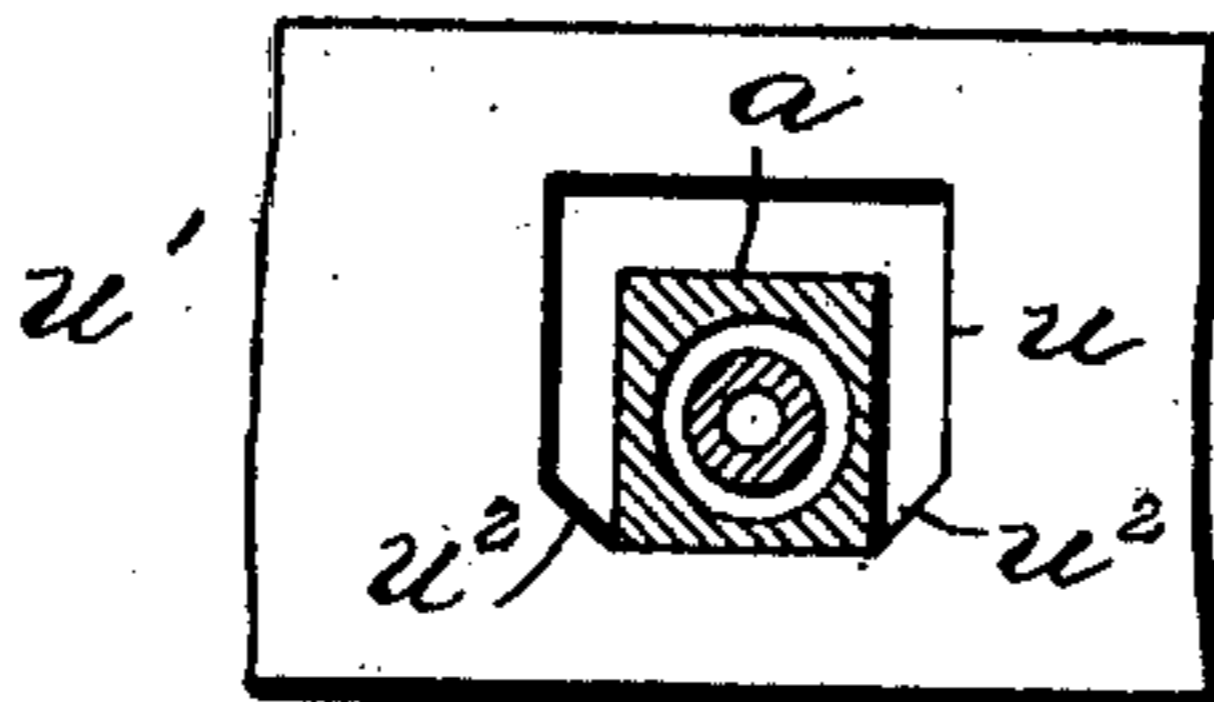


Fig. 5.



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2 SHEETS—SHEET 2.

Fig. 6.

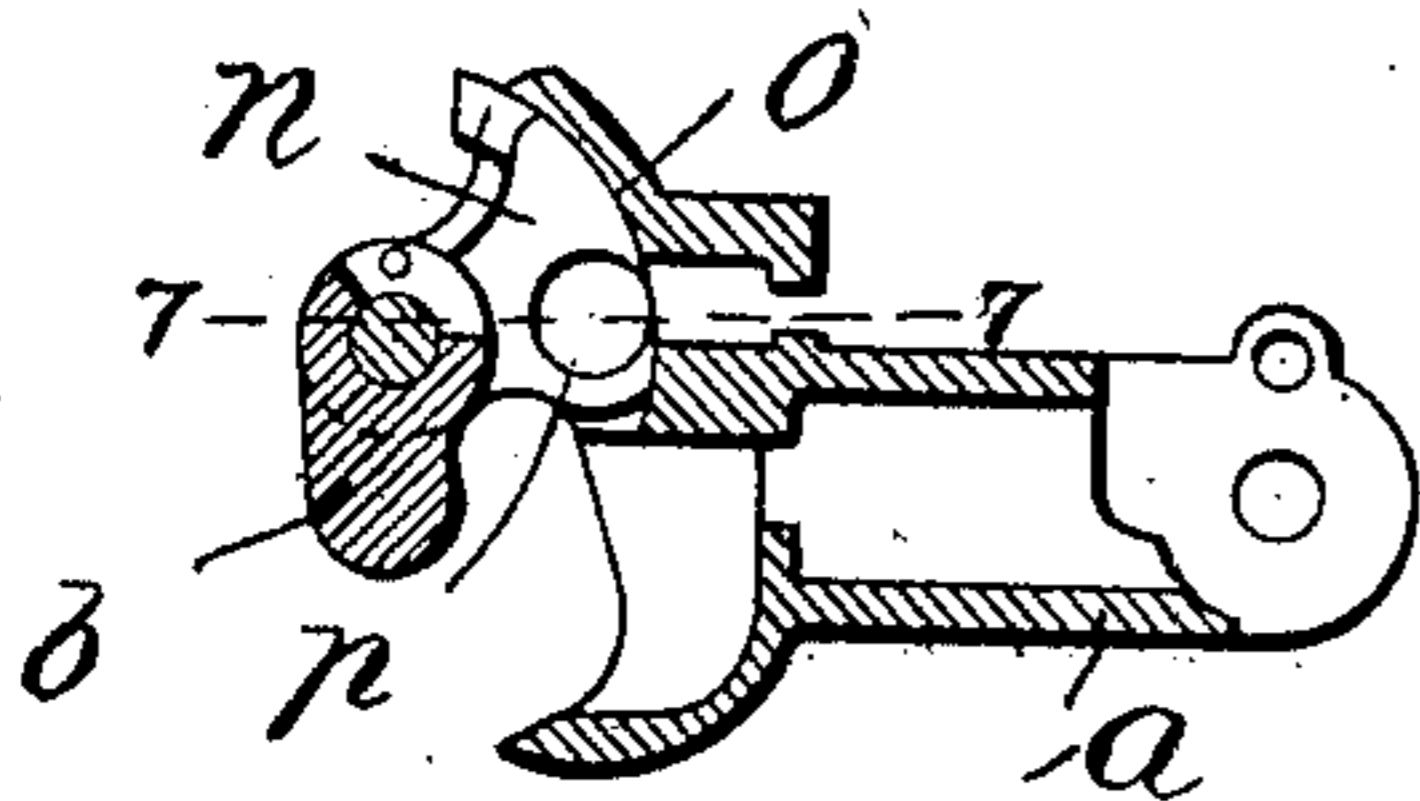


Fig. 8.

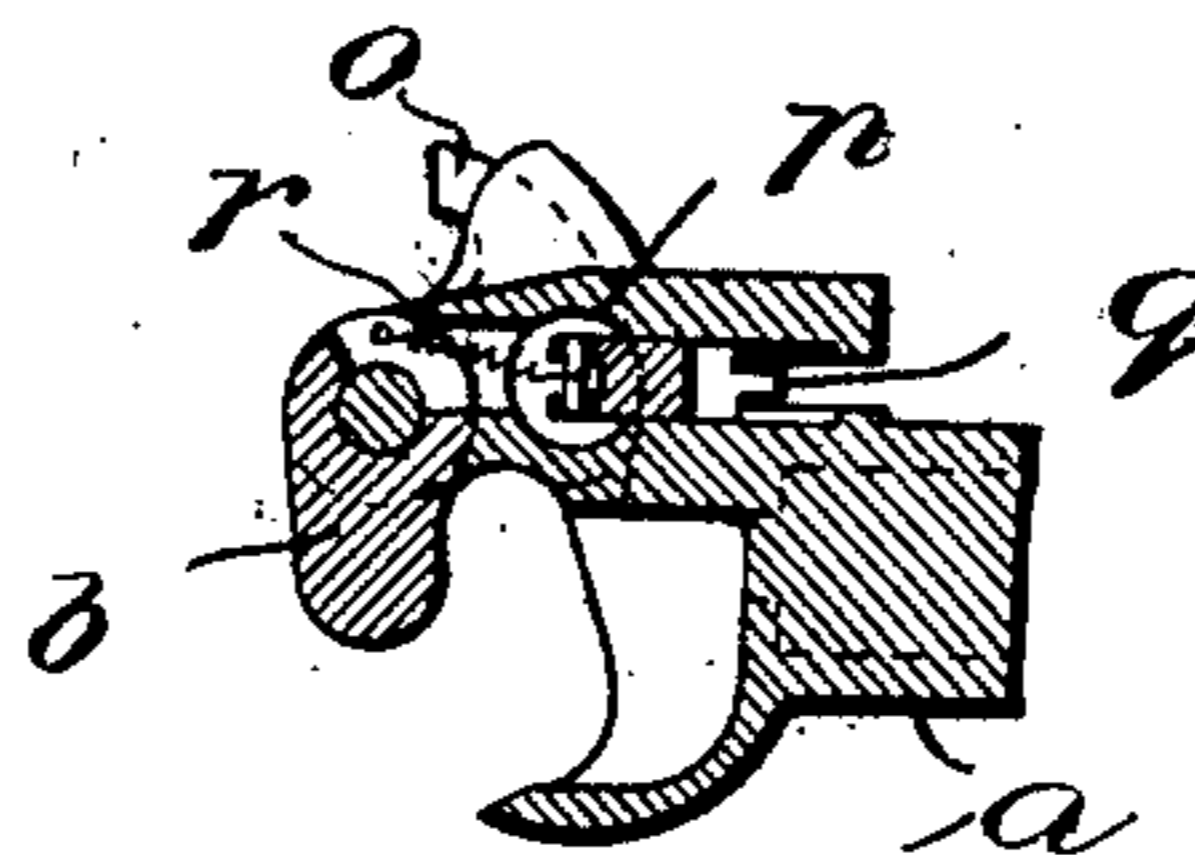


Fig. 7.

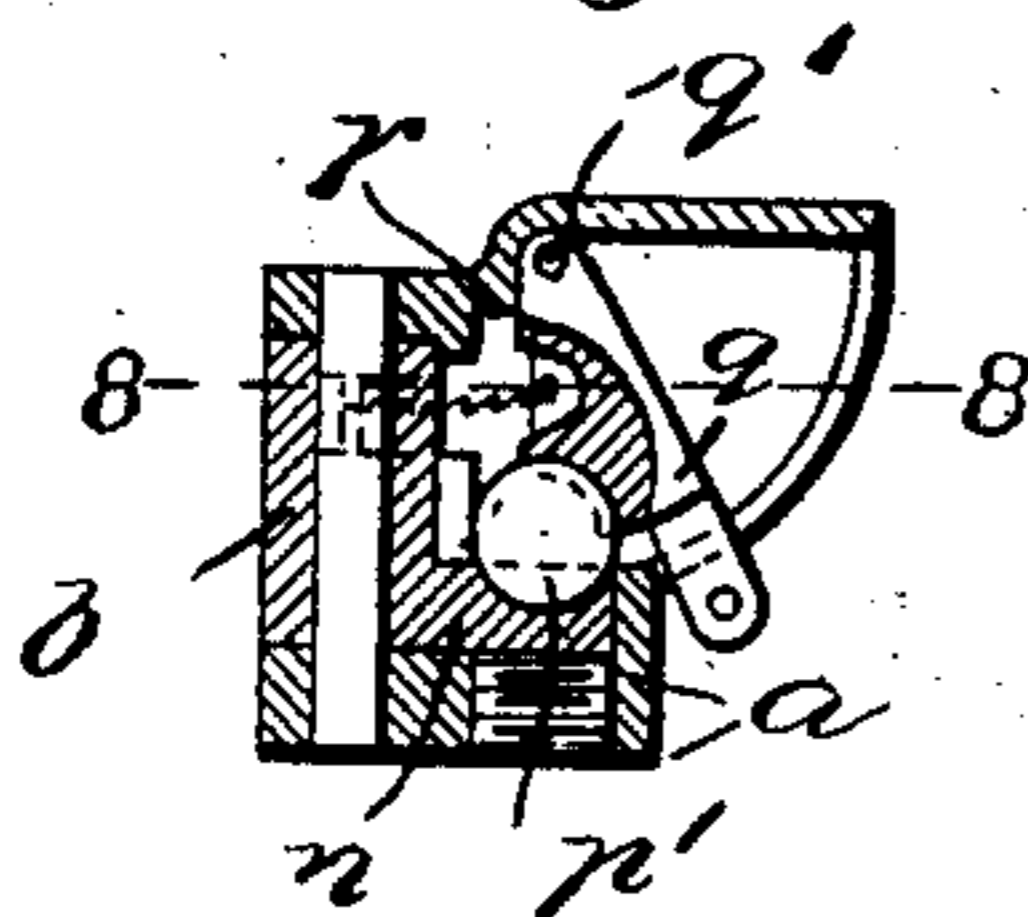


Fig. 9.

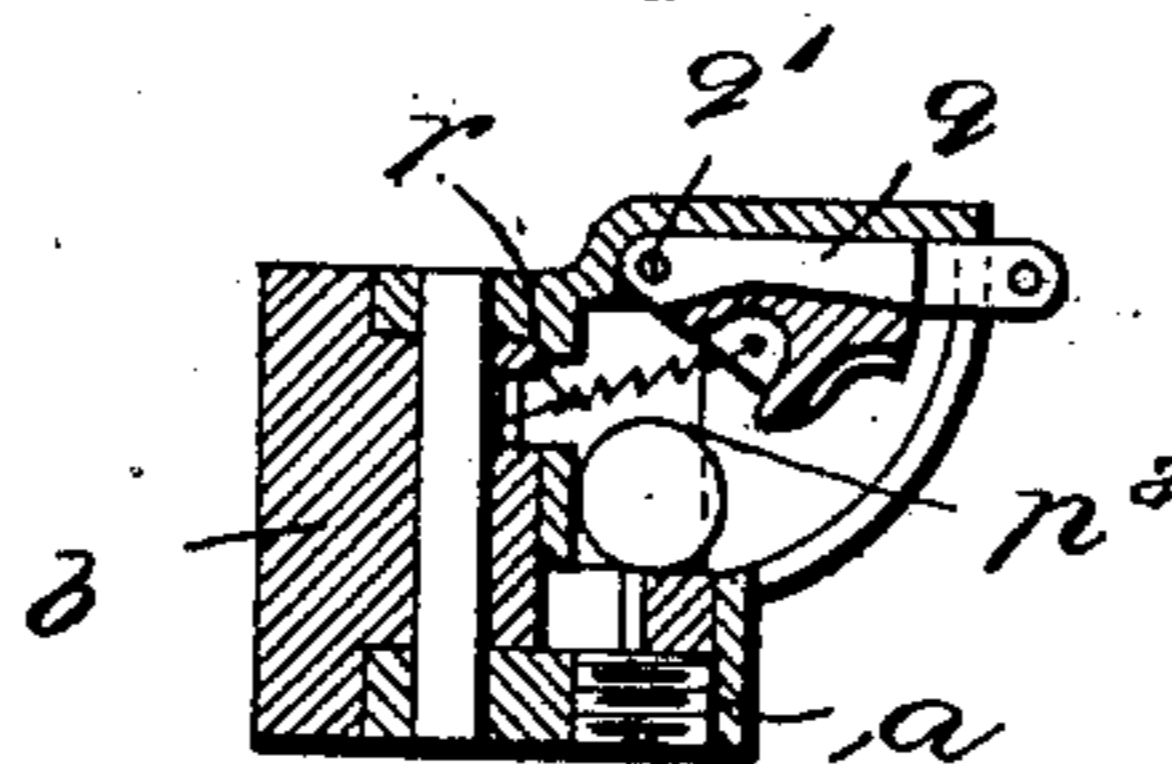


Fig. 10.

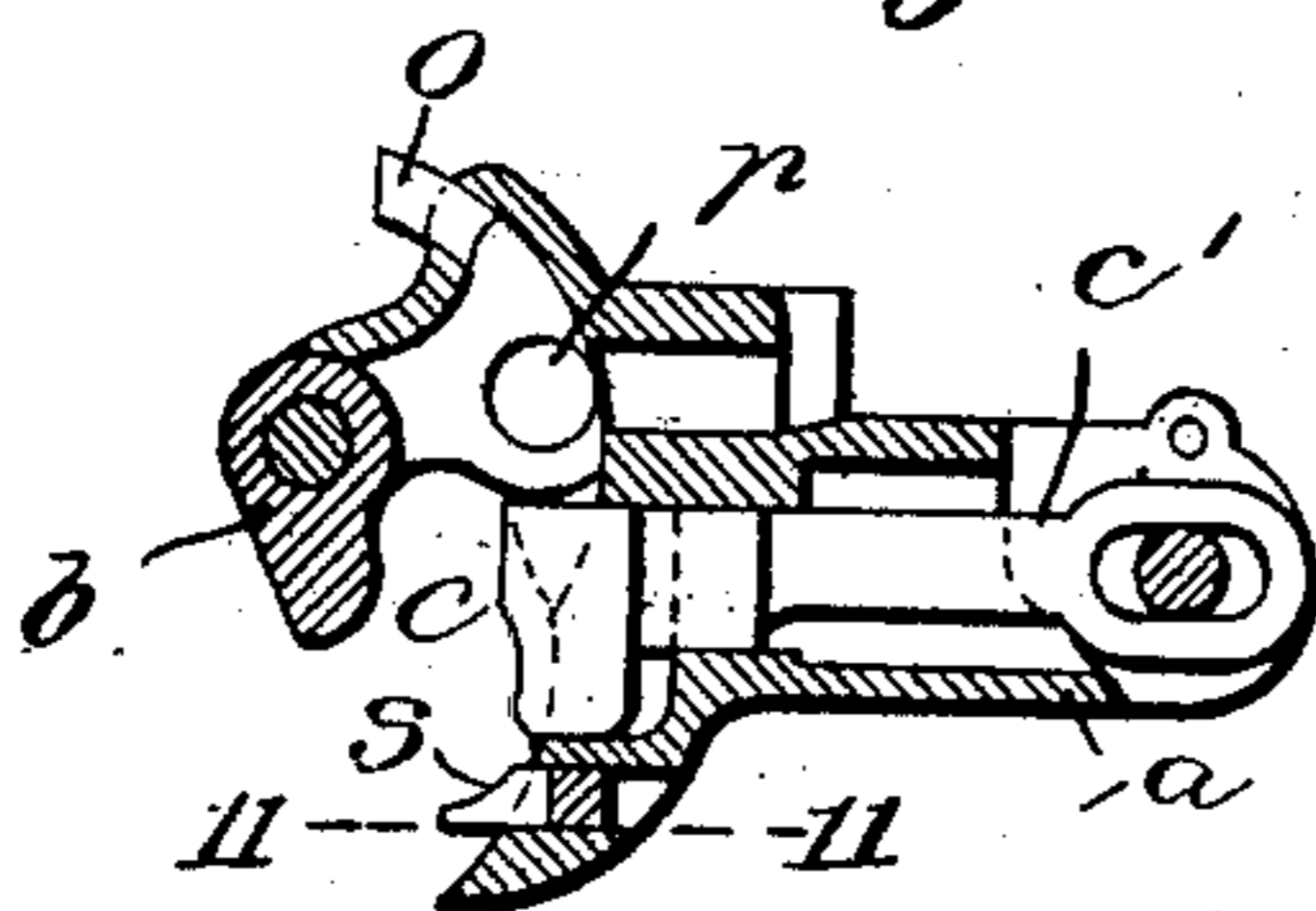
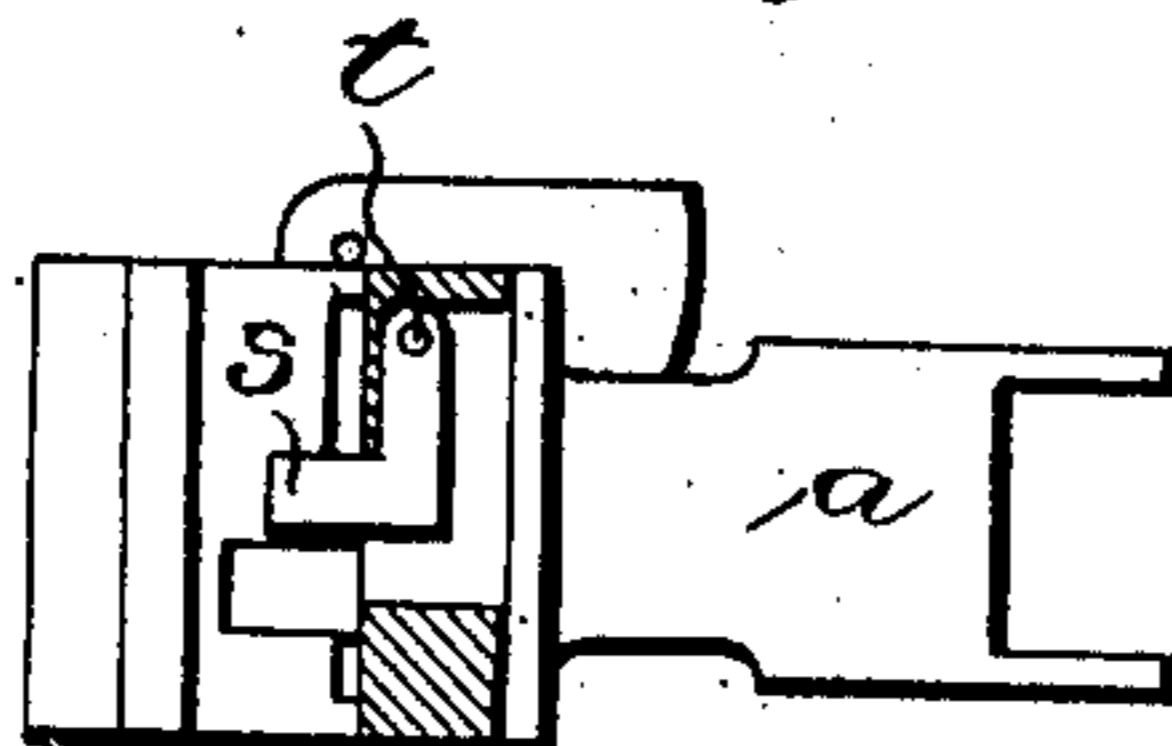


Fig. 11.



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# UNITED STATES PATENT OFFICE.

ERNEST CONWAY GAYER, OF CALCUTTA, INDIA.

## AUTOMATIC COUPLING FOR RAILWAY AND OTHER VEHICLES.

No. 829,582.

Specification of Letters Patent.

Patented Aug. 28, 1906.

Application filed September 11, 1905. Serial No. 277,995.

*To all whom it may concern:*

Be it known that I, ERNEST CONWAY GAYER, a subject of the King of Great Britain, residing at 11 Hasting street, Calcutta, India, have invented new and useful Improvements in Automatic Couplings for Railway and other Vehicles, of which the following is a specification.

This invention relates to improvements in automatic couplings chiefly designed for use upon railway rolling-stock.

According to the invention each coupler comprises a pivoted front jaw and a loose rear jaw. The front jaw is hinged to the draw-bar in such a way that when it is released it swings open and keeps open. The draw-bar is made hollow to receive the shank of the rear jaw, adapted to move longitudinally therein. The pivoted jaw is secured in the coupling position by means of a suitable catch or lock—such, for example, as a sliding bolt which is operated by any suitable means to disengage the jaw when it is desired to release the coupling—and the shank of the loose jaw bears at its inner end against a thimble loosely mounted upon a rod having a shoulder between which and the said thimble a spring is coiled around the said rod. The rear end of the draw-bar extends through a central hole in a cross-head suitably secured to the frame of the vehicle and is provided with a thimble having a head with a spherical face bearing against the edge or lip of the opening. This cross-head is provided with rearwardly-extending links or the like carrying a second cross-head loosely mounted upon the end of the draw-bar. Between the thimble-head and the second cross-head there is arranged a spring normally holding the said second cross-head against an adjustable head provided upon the end of the draw-bar. The front of the first-named cross-head has pivoted to it an arm or lever which extends through a slot in the draw-bar in front of the inner end of the rod of the loose jaw. With this arrangement when the couplers are in operation the front jaw of each coupler is gripped between the front jaw of the opposing coupler and the loose jaw thereof, and when the device is in tension the draw-bar of each coupler is pulled forward and compresses the spring between the two cross-heads, the lever pivoted to the first cross-head coming into contact with the inner end of the spring-rod in connection with

the loose jaw and applying it with the necessary force against the front jaw of the opposing coupler. When the tension is relaxed, the spring between the two cross-heads withdraws the draw-bar, and the spring in connection with the rod of the loose jaw diminishes the pressure upon this loose jaw. When the draw-bar is moved back to a predetermined extent, the end of the aforesaid lever comes into contact with the cross-head, and thus acts as a fixed stop against which the inner end of the spring-rod bears, so as to relieve the loose jaw of the pressure of its spring.

In the accompanying drawings, Figure 1 is a side elevation of an automatic coupling constructed according to the invention. Fig. 2 is a sectional plan thereof. Fig. 3 is an end view of the draw-bar and coupling-jaws. Fig. 4 is a section on the line 4 4, Fig. 2. Fig. 5 is a section on the line 5 5, Fig. 2. Fig. 6 is a horizontal section illustrating a modified form of the coupler. Fig. 7 is a section on the line 7 7, Fig. 6. Fig. 8 is a section on the line 8 8, Fig. 7. Fig. 9 is a view similar to Fig. 7, but showing the parts in another position. Fig. 10 is a horizontal section of a further modified construction of coupler. Fig. 11 is a section on the line 11 11, Fig. 10.

Referring first to the arrangement illustrated in Figs. 1 to 5, *a* represents the draw-bar, which is made hollow. *b* is the front jaw, which is pivoted at *b'* to the outer end of the hollow draw-bar *a*, and *c* is the loose rear jaw, which is fitted upon the shank *c'*, located within the hollow draw-bar *a*, in which it can move longitudinally. *d* is the thimble, which is provided within the hollow draw-bar *a* and is loosely mounted upon the rod *e*, which extends through the rear end of the draw-bar *a* and is provided with the shoulder *e'* within the same. The rear end of the shank *c'* of the loose jaw *c* bears against the outer end of the thimble *d*, and the spring *f* is coiled around the rod *e* between the inner end of the thimble *d* and the aforesaid shoulder *e'*, against each of which it bears. *g* is the cross-head, which is secured to the frame *A* of the vehicle and is provided with the central hole *g'*, through which the end of the draw-bar *a* extends, the portion thereof which engages with the hole having a thimble *h*, provided with the spherical bearing-face *h'*, which makes contact with the edge or lip of the hole or opening *g'*, as indicated in Fig. 2. *i* is the second cross-head, which is loosely mounted

upon the end or extension  $a'$  of the draw-bar and is connected to the cross-head  $g$  by means of the links  $i'$ . The draw-bar extension  $a'$  is provided with the adjustable head  $i^2$ , having a spherical surface bearing against the edge of the hole in the cross-head  $i$ , against which head the cross-head  $i$  is normally held by means of the spring  $i^3$ , which is coiled around the draw-bar extension  $a'$  and bears against the thimble  $h'$  and the cross-head  $i$ , respectively.  $j$  is the arm or lever, which is pivoted to a bracket  $j'$  upon the cross-head  $g$  and passes through the slot  $j^2$ , formed in the draw-bar  $a$ , the object of this lever being to control the loose jaw  $c$ , as hereinafter described. As before described, the front jaw  $b$  is so pivoted to the draw-bar  $a$  that when released it swings open and tends to remain open and is locked in the coupling position by a suitable catch or lock. In the arrangement illustrated in Figs. 1 to 5 the lower end of the hinge-pin  $b'$ , upon which the jaw  $b$  is keyed, is beveled, as shown at  $b^2$ , and this beveled surface acts in conjunction with a similar surface upon the upper end of a fixed pin  $k$ , the two surfaces being so arranged relatively with one another that they form a kind of drop-hinge, tending to cause the jaw  $b$  when released to assume the open position (shown in broken lines in Fig. 2) under the action of its own weight. The said jaw  $b$  is provided with a tail  $b^3$ , with which can engage the bolt  $l$ , which is arranged to slide in a guide in the head of the draw-bar  $a$  and is normally held in the locking position by means of the weighted lever  $m$ , suspended to a lug  $l'$  upon the draw-bar head. Any suitable means may be utilized for releasing the bolt  $l$ , so as to free the jaw  $b$ —such, for example, as a lever or chain secured to the lug  $l'$  on the bolt.

Figs. 6 to 9 illustrate a modification of the catch or lock for the hinged jaw  $b$ . In this case the said jaw  $b$  is provided with a segmental tail  $n$ , which works in a correspondingly-shaped guide  $o$ , formed in the draw-bar head, and is provided with a cup-shaped depression or recess  $p$ , within which a ball  $p'$  can lodge when the jaw  $b$  is in the coupling position. This ball is capable of vertical movement in the recess  $p^2$  in the draw-bar head and when it is in engagement with the recess  $p$  is held therein so as to lock the jaw  $b$  by means of the catch  $q$ , pivoted in the draw-bar head at  $q'$ . This catch is in connection with the tail  $n$  of the jaw by means of the spring  $r$ , which therefore fulfils two functions—namely, to bring the catch  $q$  into the locking position and to draw the jaw  $b$  open when the catch is withdrawn to the unlocking position (shown in Fig. 9) by any suitable means—such, for example, as a lever or chain—or in lieu of the spring  $r$  I may make use of a rod or link having sufficient play between the jaw and catch for the latter to be lifted just

clear of the ball  $p'$ , thereby enabling it to rise before it has any action on the jaw. With this arrangement any further movement of the catch would also open the jaw, which could be opened from the side of the wagon. 70

In Figs. 10 and 11 I have illustrated a form of the coupling in which the ball-catch just described is also used, but wherein the draw-bar head is also provided with a gravity-pawl  $s$ , the said pawl being hinged at its upper end at  $t'$  to the draw-bar head and being designed to lock the opposing coupler in position against lateral withdrawal, the said pawl being displaced by the opposing coupling when the two couplings are brought together, so as to permit of their engagement and subsequently dropping into the locking position by its own weight. In this form of coupler the jaws need not be opened to effect coupling by reason of the inclined front face of the jaws. 85

The improved coupling operates as follows—that is to say, when two couplers are engaged the front jaw  $b$  of each coupler is gripped between the front jaw  $b$  of the other coupler and the loose jaw  $c$  thereof. When the coupling is in tension, the draw-bar  $a$  of each coupling is drawn forward and presses the spring  $i^3$  and brings the lever  $j$  into contact with the end of the rod  $e$ . The lever  $j$ , which obtains its fulcrum at the point  $j^3$ , moves the rod  $e$  forward relatively with the draw-bar, so as to apply the loose jaw  $c$  with the necessary force against the front jaw  $b$  of the opposing coupler. When the tension on the draw-bar is relaxed, the spring  $i^3$  withdraws the said draw-bar, and the lever  $j$  allows the spring  $f$  to relax its pressure upon the loose jaw  $c$ . The said jaw  $c$  is wholly relieved of the pressure of the spring  $f$  when the free end of the lever  $j$  comes into contact with the cross-head  $g$ . The thimble  $h$  and the head  $i^2$  upon the draw-bar are made with the spherical surfaces shown and above mentioned to permit of movement of the draw-bar laterally with respect to the fixed cross-heads, and in order that the draw-bar shall return to the central position after such movement the hole  $u$  in the front plate  $u'$  of the vehicle-frame is provided with inclined planes  $u^2$  at the lower angles, so that after lateral displacement the draw-bar is returned to its central position by gravity. 110

In practice it is advantageous to hinge the front part of the draw-bar  $a$ , as indicated at  $v$ , and to provide the same in the plane of the hinge with a coupling-hook  $w$ . This coupling-hook is pivoted upon a pin  $w'$ , passing transversely through the draw-bar, the shank  $c'$  of the jaw  $c$  being slotted at this part, as shown at  $c^2$ , to permit of the passage of the pin through it in such a manner as not to interfere with its longitudinal movement. With this construction should it be necessary to use the auxiliary coupling  $w$  in lieu of the 120 125 130

automatic coupler for any reason the front part of the draw-bar *a* can be swung to one side, so as to bring the coupling-hook *w* into axial alinement with the rear part of the draw-bar. The two parts of the draw-bar are locked into the operative position by any suitable means—such, for example, as a pin *x* engaging the overlapping lugs upon the said two parts.

10 Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In an automatic coupling the combination with a movable draw-bar, of a front jaw 15 secured thereto, a rear jaw movably mounted on said bar said rear jaw being normally subjected to no forward pressure and means whereby the forward movement of said bar will throw said rear jaw forward thereon, 20 substantially as described.

2. In an automatic coupling, the combination with a movable draw-bar, of means for normally and yieldingly retaining said bar in 25 a rearward position, a front jaw secured to said bar, a rear jaw movably mounted on said bar said rear jaw being normally subject to no forward pressure and means whereby the forward movement of said bar will throw 30 said rear jaw forward thereon, substantially as described.

3. In an automatic coupling, the combination with a movable draw-bar, of means for normally and yieldingly retaining said bar in 35 a rearward position, a front jaw secured to said bar, a rear jaw movably mounted on said bar, means for normally relieving said rear jaw of forward pressure and means whereby the forward movement of said bar will throw said jaw forward thereon, sub- 40 stantially as described.

4. In an automatic coupling, the combination with a longitudinally and laterally movable draw-bar, of yielding means for nor- 45 mally holding said bar in a rearward position and preventing lateral movement thereof, a front jaw pivoted to said bar, a rear jaw movably mounted on said bar, means for normally relieving said movable jaw of forward 50 pressure, means whereby the forward movement of said bar will throw said movable jaw forward thereon, substantially as described.

5. In an automatic coupling, the combination with a movable draw-bar, of a front jaw 55 pivoted thereto and adapted to normally remain in an inoperative position, means for locking said jaws in operative position, a rear jaw movably mounted on said bar said rear jaw being normally subject to no forward 60 pressure and means whereby the forward movement of said bar will throw said mov-

able jaw forward thereon, substantially as described.

6. In an automatic coupling, the combination with a movable draw-bar, of a front jaw 65 pivoted thereto and adapted to normally remain in an inoperative position, a sliding bolt adapted to lock said jaw in operative position, a rear jaw movably mounted on said bar said rear jaw being normally subject to 70 no forward pressure and means whereby the forward movement of said bar will throw said movable jaw forward thereon, substantially as described.

7. In an automatic coupling, the combination with a movable bar comprising a front 75 and rear section, a flexible connection between said sections, means for making said connection rigid, of a hook secured to the forward end of said rear section, a front jaw se- 80 cured to said front section, a rear jaw movably mounted in said front section and means whereby the forward movement of said draw-bar will throw said movable jaw forward 85 thereon, substantially as described.

8. In an automatic coupling, the combination with a draw-bar loosely mounted in a cross-head, a cross-head secured to the rear end of said draw-bar, a coiled spring be- 90 tween said cross-heads, a front jaw secured to said bar, a rear jaw slidingly mounted in said bar, a sliding bar mounted in said draw-bar adapted to bear against said rear jaw, a coiled spring adapted to retain said sliding 95 bar in a rearward position and a lever pivoted to said cross-head and adapted to be operated by said draw-bar to force said sliding bar forward against said rear jaw, substan- 100 tially as described.

9. In an automatic coupling, the combination with a cross-head provided with an ori- 100 fice, of a flaring thimble having a portion extending through said orifice, a draw-bar having an extension slidingly mounted in said thimble, a cross-head loosely mounted on 105 said extension, a rounded head on said extension, a coiled spring around said extension and bearing against said cross-heads, a front jaw secured to said bar, a rear jaw slidingly mounted in said bar, a sliding bar 110 mounted in said draw-bar and adapted to bear against said rear jaw, a coiled spring normally holding said sliding bar in a rearward position and a lever adapted to be operated by said draw-bar to throw said sliding 115 bar forward against said rear jaw, substantially as described.

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Witnesses:

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J. M. MILNER.