

**No. 616,395.**

**Patented Dec. 20, 1898.**

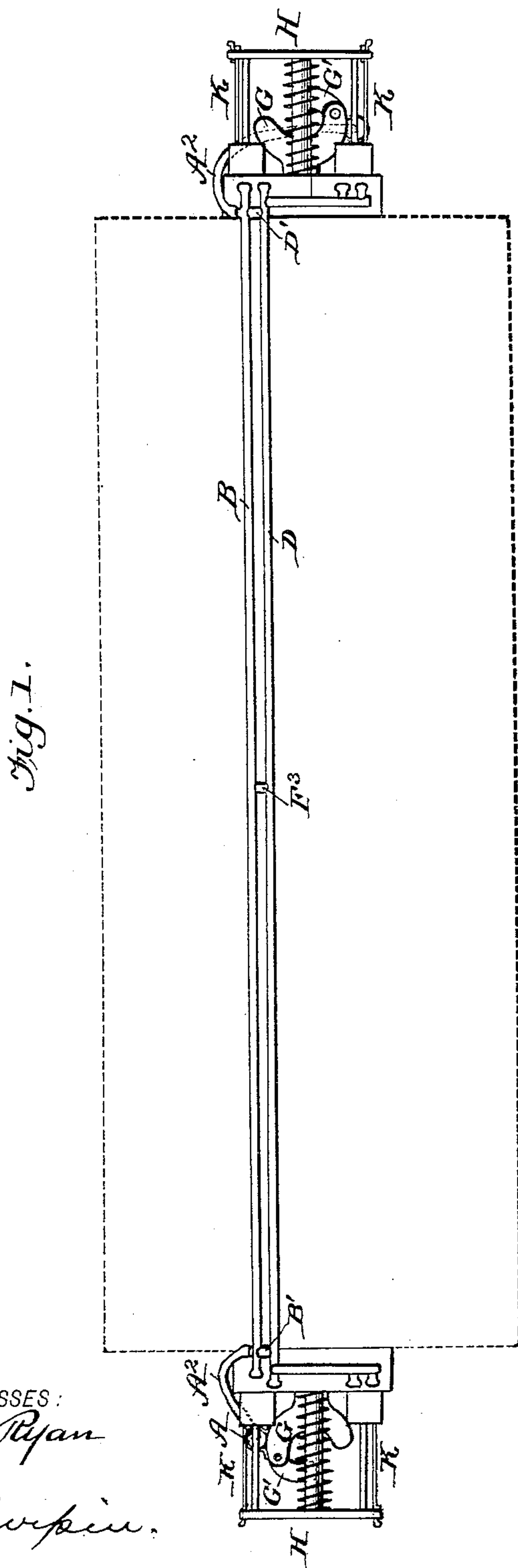
**S. BEDFORD.**

**CAR COUPLING AND OPERATING DEVICE THEREFOR.**

(Application filed Mar. 12, 1898.)

(No Model.)

**3 Sheets—Sheet 1.**



WITNESSES :

Jos. A. Ryan

P.B. Zwipen.

INVENTOR

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BY *Munn & Co.*

ATTORNEYS.

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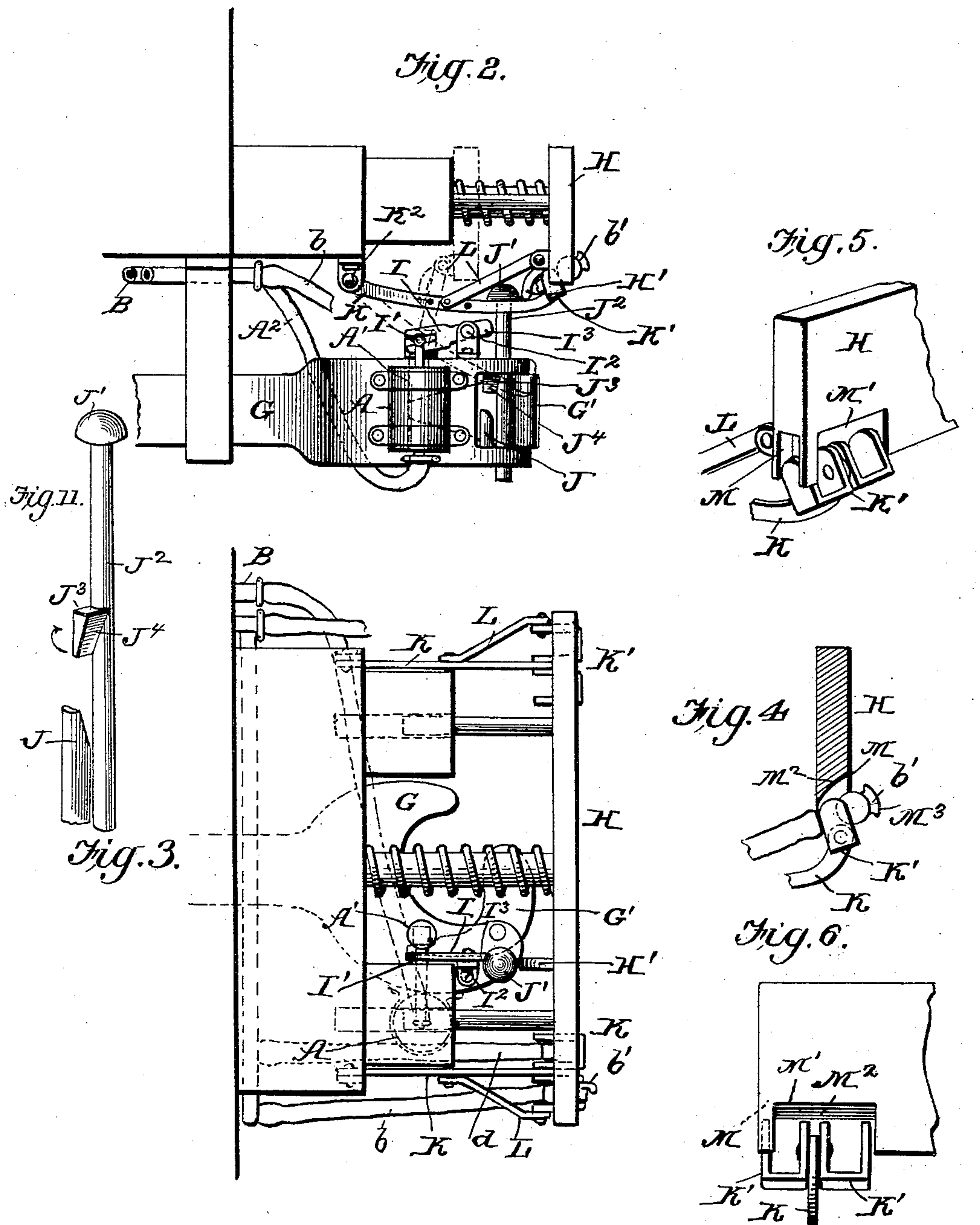
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**3 Sheets—Sheet 2.**



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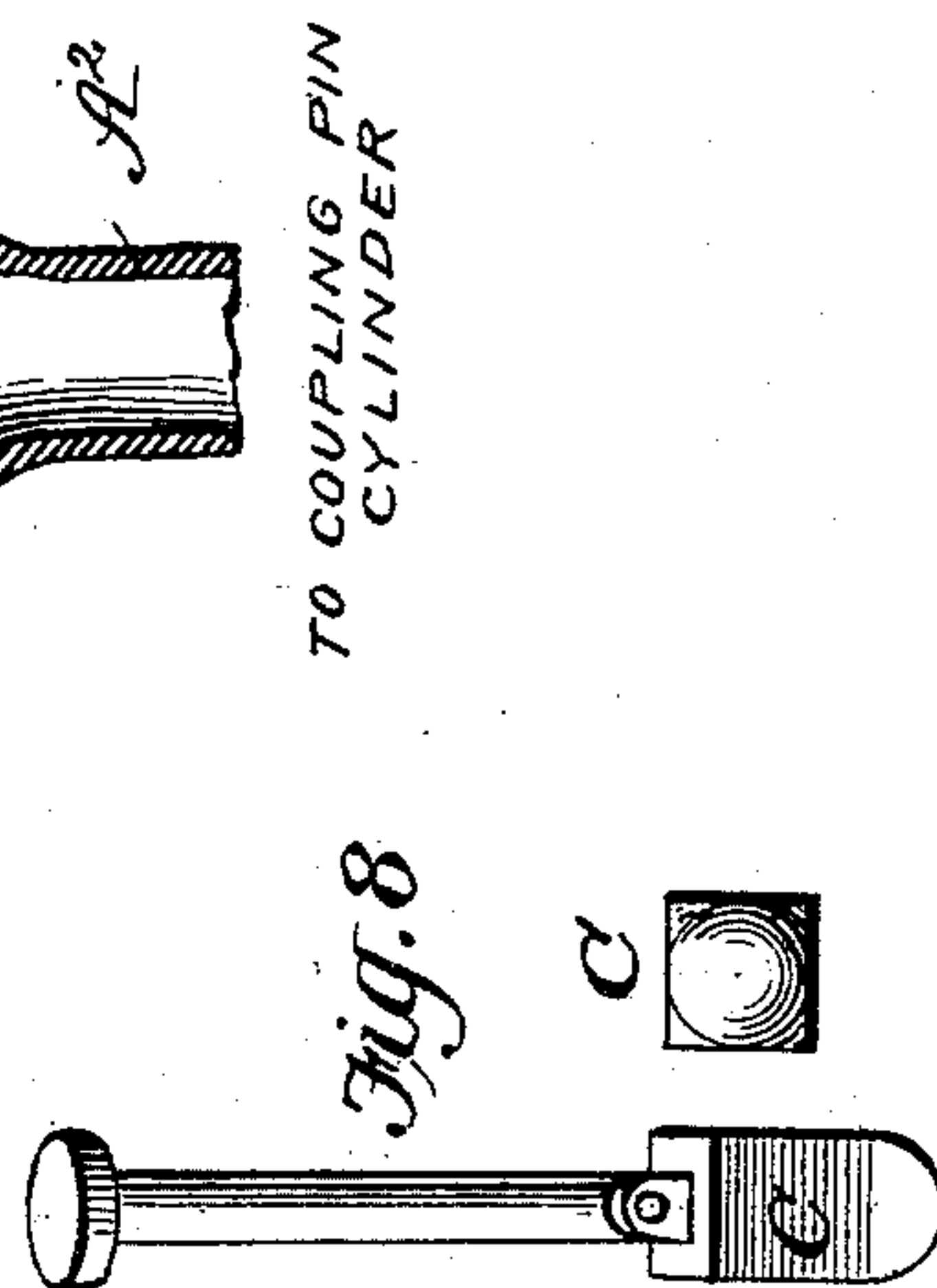
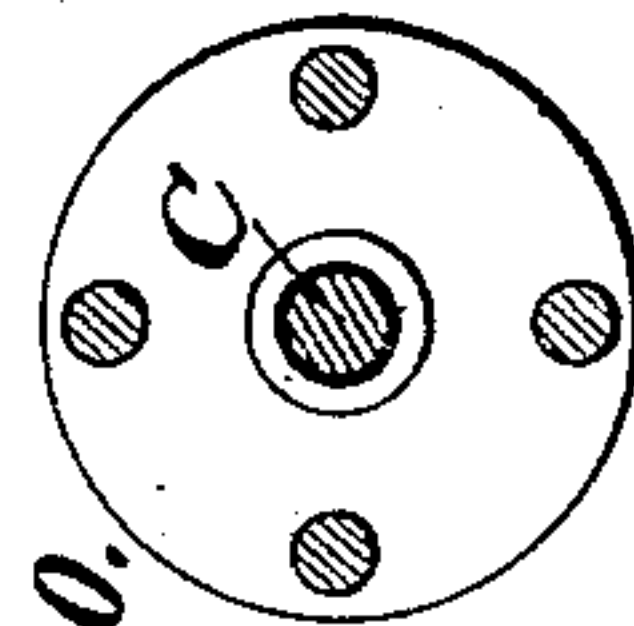
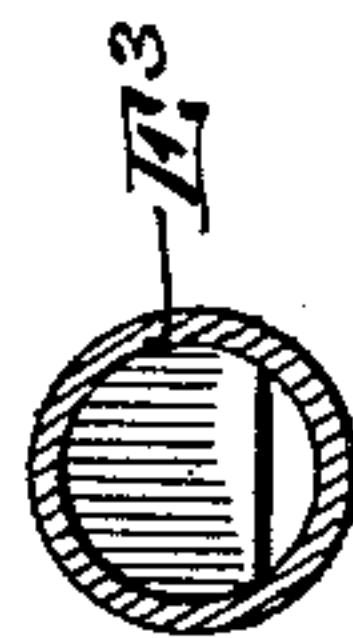
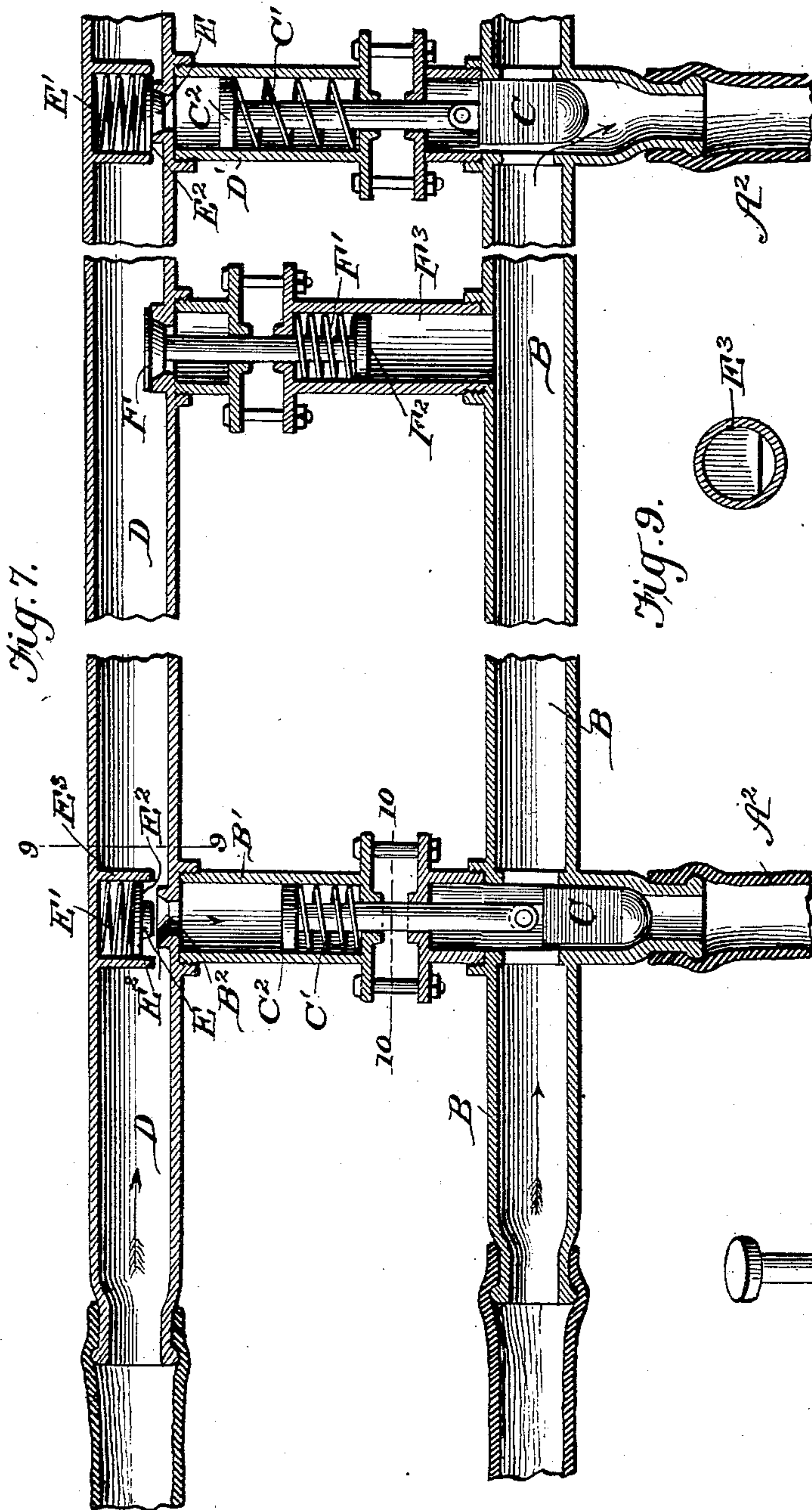
S. BEDFORD.

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(Application filed Mar. 12, 1898.)

(No Model.)

3 Sheets—Sheet 3.



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# UNITED STATES PATENT OFFICE.

SETH BEDFORD, OF CHARLESTON, MISSOURI.

## CAR-COUPLING AND OPERATING DEVICE THEREFOR.

SPECIFICATION forming part of Letters Patent No. 616,395, dated December 20, 1898.

Application filed March 12, 1898. Serial No. 673,590. (No model.)

*To all whom it may concern:*

Be it known that I, SETH BEDFORD, residing at Charleston, in the county of Mississippi and State of Missouri, have made certain new and useful Improvements in Car-Couplings and Operating Devices Therefor, of which the following is a full, clear, and exact specification.

My invention is an improvement in car-couplings and in devices for operating the same, and has for an object, among other improvements, to furnish means for automatically setting the coupling-jaws into position to receive each other as the cars come together, to furnish means whereby air-pressure may be utilized to uncouple, to furnish means whereby air-pressure may be utilized to control the passage of air to the uncoupling devices under the control of the engineer so a train may be uncoupled at any point, and to furnish couplings for such air-pipes arranged to be automatically united when pressed together by the meeting bumpers.

The invention consists in certain features of construction and novel combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a diagrammatic bottom plan view of a car provided with my improvement. Fig. 2 is a side view of the car-coupling devices. Fig. 3 is a top plan view thereof. Fig. 4 is a side view of the car-coupling devices in coupled position. Fig. 5 is a detail view of the hose-coupling support. Fig. 6 is a detail view illustrating the hose-coupling. Fig. 7 is a sectional view illustrating the pressure-pipe and the valve-operating air-pipe with their connections and valves. Fig. 8 is a detail view of the valve and piston by which the passage of air to the uncoupling-cylinder is controlled. Fig. 9 is a detail section on about line 9 9, Fig. 7. Fig. 10 is a detail cross-section on about line 10 10 of Fig. 7, and Fig. 11 is a detail view of the releasing-pin.

In carrying out my invention I provide for uncoupling the cars at any point in the train by means of fluid-pressure under the control of the engineer, varying pressure being employed to effect the uncoupling at different points, such varying pressure being supplied

to the pressure-pipe, presently described, by means of the pressure devices now commonly employed on locomotives and supplied with a suitable pressure-gage for indicating the pressure; but as such pressure supplying and indicating devices are not in themselves of my invention it does not seem necessary to illustrate them in detail herein.

In carrying out my invention I provide in connection with the car-coupling devices an air-cylinder A, having its piston connected with the coupling or locking pin A' of the coupling, so that when air is admitted under pressure to the cylinder A it will release the coupling. This may be effected in various ways other than that shown, and I do not desire to be limited to any particular mode of applying the air-pressure to the coupling devices to uncouple the same.

The air is led from the pressure-pipe B to the cylinder A through a pipe A<sup>2</sup>, which is controlled by a valve C, and as the valve C and pipes A<sup>2</sup> in connection with each coupling are alike the description of one will answer for all.

Before proceeding it might be well to state that in connection with the cars I use for the uncoupling purposes a system of pipes comprising two pipes and their connections, such pipes D and B being for convenience of reference designated, respectively, as the "valve-operating air-pipe" and the "pressure-pipe," the latter pipe B carrying the pressure by which the uncoupling is effected and the pipe D the pressure for operating the valves controlling the passage of the pressure from the pipe B to any particular coupling which it may be desired to release. The pipes D and B are coupled to the corresponding pipes of the meeting cars in any suitable way, preferably by means of the devices presently described.

The valve C, which controls the passage of air from the pipe B to the cylinder A, operates transversely the pipe B and is normally unseated by the spring C' and is connected with the piston C<sup>2</sup>, which operates in a cylinder B', in communication through a port B<sup>2</sup> with the pipe D, such port D<sup>2</sup> being controlled by the valve E, which valve E is seated by a spring E' and is arranged to be unseated by a proper



pressure in the pipe D. To this end the valve E has a flange or surface  $E^2$ , which receives the pressure of the fluid in the pipe D, and such valve E operates in a cylindrical casing  $E^3$ , whose lower end is open and encircles the port  $B^2$ . By this construction the valve E forms a closure in the pipe D, beyond which the pressure in such pipe cannot pass when the valve is closed, so that the opening of the valve E serves two purposes in that it first permits the passage of the air to close its corresponding valve C by action on its piston  $C^2$  and also permits the passage of the pressure in the pipe D to the succeeding valve or valves E. Thus in operation (see Fig. 7) we will suppose the pressure as coming from the left toward the right through the pipe D and it is desired to uncouple by pressure applied through the hose  $A^2$  at the right. In such case the pressure supplied through pipe D is sufficient to unseat the valve E at the left, but not sufficient to unseat both the valve at the left and that at the right. The result is that the valve E at the left will be opened and pressure will pass through the port  $B^2$  of such valve and will act on the corresponding piston  $C^2$ , and the valve C at the left will be closed, shutting off communication between the valve-operating air-pipe B and the hose  $A^2$  at the left; but such pressure in the pipe D is so regulated that while it will open the valve E at the left it will not open both such valve E at the left and that at the right, the result being that pressure will pass from pipe D to close the valve C at the left; but the valve C at the right will be held open, as shown in Fig. 7, so pressure may pass from the pipe B through the hose  $A^2$  at the right to uncouple the coupling in connection with said hose at the right.

I have only thought it necessary to describe the operation in connection with two valves E and the parts operating in connection therewith, as it is manifest the operation with a larger number of valves arranged in succession will be the same, pressure being supplied to the pipe D to the necessary extent to open all the valves E in advance of that which operates in connection with the pipe  $A^2$  for the passage of pressure to release the particular coupling it is desired to operate. In this connection I find it well to set all the valves E to release by the same pressure, as in practice if it takes ten pounds to release each valve it will in connection with a series require ten pounds to open the first valve, and then in addition an excess to twenty to open both the first and second and hold them open, and a greater pressure for the first three valves E, and so on to the end of the series.

When pressure has been properly applied through the pipe D to effect the closure of all the valves C in advance of the pipe  $A^2$ , which leads to the coupling to be operated, pressure is admitted to the pipe B, coming in the present instance from the left, as before, and the pressure will pass through the pipe B

to the proper pipe  $A^2$ , and thence to the corresponding cylinder A to release the coupling.

After the uncoupling is effected the pressure in the pipe D may be freed by means of the release-valve F, which is closed by a spring  $F'$ , and may be opened by pressure from the pipe B, acting on a piston  $F^2$  in a cylinder  $F^3$  in communication with the pipe B, a greater pressure being required in the pipe B for opening the release-valve F than is ordinarily required for effecting the uncoupling operation before described.

The coupling between the cars includes the draw-bar G and the spring-pressed bumper H, the draw-bar G being supplied with an ordinary Janney type coupling-jaw  $G'$  and a vertically-moving pin  $G^2$  for locking said jaw  $G'$  in coupled position. This pin  $G^2$ , when lifted vertically, releases the jaw  $G'$ , and I provide for lifting the pin both by air-pressure through the pipe  $A^2$ , as before described, and by mechanically-operating devices which include a lever I, engaging at  $I'$  with the pin  $G^2$  at one end, pivoted at  $I^2$  between its ends on the draw-bar and having its front end at  $I^3$  arranged for engagement by the head  $J'$  of a pin  $J^2$ , which may be moved vertically by the backward movement of the spring-bumper H in the manner presently described. This pin  $J^2$  has a dual function. In the first place as it is depressed its head  $J'$  strikes upon the end  $I^3$  of the lever I, depressing such end  $I^3$  and raising the other end, which, being connected with the pin  $G^2$ , lifts such pin  $G^2$  and releases the jaw  $G'$ , so the latter may open. After the pin  $J^2$  has operated to release the pin  $G^2$  it is given a partial revolution to cause its crank  $J^3$  to throw the jaw  $G'$  open. This partial revolution is effected by a cam-surface  $J^4$  on the pin  $J^2$  engaging with an abutment J on the draw-bar after the pin  $J^2$  has operated to release the pin  $G^2$  so the jaw  $G'$  may open. Hence in operation as the pin  $J^2$  is depressed it first lifts the pin  $G^2$  to release the jaw  $G'$  and is then given a partial revolution by the engagement of its cam-surface  $J^4$  with the abutment J to cause its crank-arm  $J^3$  to bear against the rear arm of the jaw  $G'$  to throw such jaw  $G'$  open in position to receive the jaw on the meeting draw-head, which latter jaw has been similarly opened, as will be readily understood. To operate the pin  $J^2$ , I make its head  $J'$  on its upper side rounded or inclined downward toward its outer edge and supply on the spring buffer or bumper H a projection  $H'$ , which as the bumper H moves rearwardly engages with the cam-like surface at the top of the pin  $G^2$  and depresses such pin to secure the operation of the parts actuated by the pin  $J^2$ , as before described.

At their ends the pipes B and D have hose-sections  $b$  and  $d$ , which are supplied at their free ends with the coupling-sections  $b'$  and  $d'$ , which mate with corresponding sections on the meeting draw-head and are automatically adjusted into coupled connection as the draw-heads meet.



The coupling-sections  $b'$  and  $d'$  are supported in the yokes  $K'$  at the front ends of the arms  $K$ , which are pivoted at  $K^2$  to the beam at the end of the car and are arranged to be raised and lowered by the movements of the spring-bumper  $H$  back and forth, being lowered by the rearward movement of the bumper and raised as the bumper moves forward. This is effected by means of the link  $L$ , pivoted at one end to the swinging arm  $K$  and at its other to the bumper  $H$ , as before indicated.

In the position of the parts shown in Fig. 2 the yokes  $K'$  rest in recesses  $M$  in the lower edge of the bumper  $H$ , and the coupling-sections protrude through notches  $M'$  in the front edge of said bumper in position for engagement by the coupling-sections on the meeting draw-head. The upper walls of the notches  $M'$  are beveled or inclined at  $M^2$ , forming a surface which is impinged by the projecting surface at  $M^3$  of the coupling-section on the approaching draw-head and forces such section downward. It should be understood that the coupling-sections  $b'$  and  $d'$  are of the ordinary Westinghouse type and are not claimed by me to be of my invention.

From the foregoing it will be seen the coupling-sections are held up to the bumper until the coupling is effected, when the rearward movement of the bumper will throw the supporting-arms  $K$  down and the latter will hold the hose-sections in the position ordinarily assumed by the coupled hose-sections of the brake-pipes.

Where desired, arms  $K$  may be employed to support the hose-pipe sections of the brake-pipes, and it is obvious that the fluid-pressure pipes  $B$  and  $D$  may be duplicated at both sides of the car to facilitate the coupling of cars which may be turned end to end.

It should be understood that the valves  $C$  have a slight play in the direction of length of the pipe  $B$ , so that when such valves are open or off their seats pressure in either direction will force them over against the opposite side from the direction of pressure and so close the passage through the pipe  $B$  until such particular valve  $C$  is closed.

It will be understood that in practice I prefer to use in connection with my pipes  $B$  and  $D$  a signal-whistle in the locomotive in connection with either or both of such pipes to indicate a break in the pipes.

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

1. An apparatus for use in operating coupling devices comprising means whereby fluid-pressure may be utilized to uncouple the cars and means whereby fluid-pressure may be utilized to control the passage of fluid-pressure to the uncoupling devices substantially as set forth.

2. The combination of the coupling devices, the air-pipe, fluid-operated devices connected with such pipe for releasing the coupling,

valves controlling the connection of such devices with the air-pipe, a pressure-pipe, and check-valves therein by which to control the passage of the air to the several valves for controlling the connection with the air-pipe substantially as set forth.

3. The combination of the coupling devices, fluid-operated devices by which to release the coupling, an air-pipe for supplying pressure to said devices, valves controlling the passage of pressure to said devices and a separate air-pipe provided with check-valve by which to control the passage of pressure to operate said controlling-valve substantially as set forth.

4. The combination of the devices for coupling the cars, fluid-operated devices by which to release said coupling devices, a pressure-pipe in communication with said fluid-operated devices, valves controlling said connection, and a separate air-pipe for operating said valve substantially as set forth.

5. In an apparatus substantially as described the combination of the devices for coupling the cars, fluid-operated devices for releasing the coupling, an air-pipe, a pipe connecting said air-pipe with the fluid-operated devices, a valve controlling said connecting-pipe, a piston connected with said valve, a separate air-pipe, a cylinder in communication with said separate air-pipe and receiving the piston aforesaid, and a valve controlling the communication between said cylinder and its communicating air-pipe substantially as set forth.

6. In an apparatus substantially as described the combination with the car-coupling devices of fluid-operated devices for releasing said coupling devices, a pipe for supplying pressure to said releasing devices, valves controlling said supply, a separate air-pipe provided with check-valve and with connections whereby to operate the valves controlling the pressure-supply to the coupling-releasing devices, a release-valve for such air-pipe and means whereby such release-valve may be operated by pressure in the other air-pipe substantially as set forth.

7. An apparatus for releasing car-coupling devices comprising an air-pipe provided at intervals with valves controlling the supply of pressure to the releasing devices, a separate air-pipe, and devices whereby pressure in such separate air-pipe may operate the valves controlling supply of pressure to the releasing devices substantially as set forth.

8. In an apparatus substantially as described the combination of the car-coupling devices, an air-pipe for supplying pressure to said devices, a branch pipe for conducting such pressure and a valve for controlling such branch pipe, such valve when open being arranged to close the passage of pressure through the air-pipe substantially as set forth.

9. In an apparatus substantially as described the combination of the car-coupling



devices, fluid-operated devices for releasing the coupling, an air-pipe for supplying pressure to such devices, valves controlling such supply, fluid-operated devices for operating  
 5 said valves and an air-pipe having valves controlling the passage of pressure to the devices which operate the said supply-controlling valves substantially as set forth.

10 In an apparatus substantially as described the combination with a pressure-pipe and valves controlling supply therefrom of pressure-operated devices for operating such valves, a pipe for supplying pressure to such devices and check-valves controlling such  
 15 supply of pressure substantially as set forth.

11. The combination of a pressure-pipe, a coupling-hose at the end thereof, a spring-bumper, an arm pivoted at one end and arranged at its other end to support the coupling-hose, and connections between said arm  
 20 and the spring-bumper whereby the bumper may operate the arm substantially as set forth.

12. In an apparatus substantially as described, the combination with devices for coupling the cars of means whereby air-pressure may be utilized to release the coupling devices and means whereby air-pressure may  
 25 be utilized to control the passage of air to the uncoupling devices substantially as set forth.

13. The combination of the coupling devices, a movable pin, intermediate devices whereby the movements of such pin release the coupling devices and the yielding bumper  
 30 provided with means by which to operate said movable pin as the bumper is moved substantially as set forth.

14. The combination of the coupling-pin, the movable pin, a pivoted lever connected  
 40 with the coupling-pin and arranged for operation by the movable pin and the movable bumper provided with means by which to operate the movable pin substantially as set forth.

15. The combination of the coupling-pin, the movable pin, the pivoted lever connected with the coupling-pin and arranged for operation by the movable pin, such movable pin  
 50 having an inclined or cam-like head, and the movable bumper having a portion arranged to engage said head of the movable pin substantially as set forth.

16. The combination of the coupling devices including the pivoted jaw and a pin for  
 55 securing the same, a longitudinally and rotarily movable pin having a crank projection by which to throw the jaw open as the pin is moved rotarily, means whereby the longitudinal movement of said pin may release the  
 60 coupling-pin and the spring-bumper arranged

to operate the movable pin substantially as set forth.

17. The combination of the coupling devices including the pivoted jaw, and the movable pin having a cam-surface and a crank  
 65 projection arranged to open the jaw as the pin is turned, and an abutment arranged for engagement by the cam-surface whereby to effect the turning of the pin substantially as set forth.

18. The combination with the yielding bumper, provided in its under side with a seat for the coupling, sections of the hose-sections, the pivoted arm having at its outer end portions  
 70 to receive the hose-section and movable toward and from the seats in the bumper and connections between said bumper and the swinging arm whereby the movements of the bumper will control the position of the arm  
 75 substantially as set forth.

19. The combination of the yielding bumper, having a seat for the hose-coupling section and adjacent thereto a cam-like surface to engage and operate the hose-coupling section on  
 80 an approaching bumper and means for supporting the hose-coupling section substantially as set forth.

20. The combination substantially as described, of the yielding bumper provided in its lower edge with a recess to receive the  
 90 yoke on the swinging arm and having a notch leading from such recess for the hose-coupling section, the swinging arm having at its movable end the yoke to receive the hose-section, the link connecting such arm with  
 95 the bumper, the hose-section, and the hose-coupling section substantially as set forth.

21. An apparatus substantially as described comprising the coupling devices, means whereby fluid-pressure operates such devices, a conduit for such fluid, valves controlling the passage thereof to the coupling-operating means,  
 100 fluid-operated valve-operating devices and a conduit for the fluid which operates upon the valve-operating devices substantially as set forth.

22. In an apparatus substantially as described the combination of car-coupling devices, means whereby air-pressure may be utilized to release the coupling devices, the  
 110 valve controlling the passage of such pressure, a cylinder, a piston in said cylinder and connected with the said valve, and a separate air-pipe for supplying pressure to said cylinder substantially as set forth.

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Witnesses:

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