

No. 743,659.

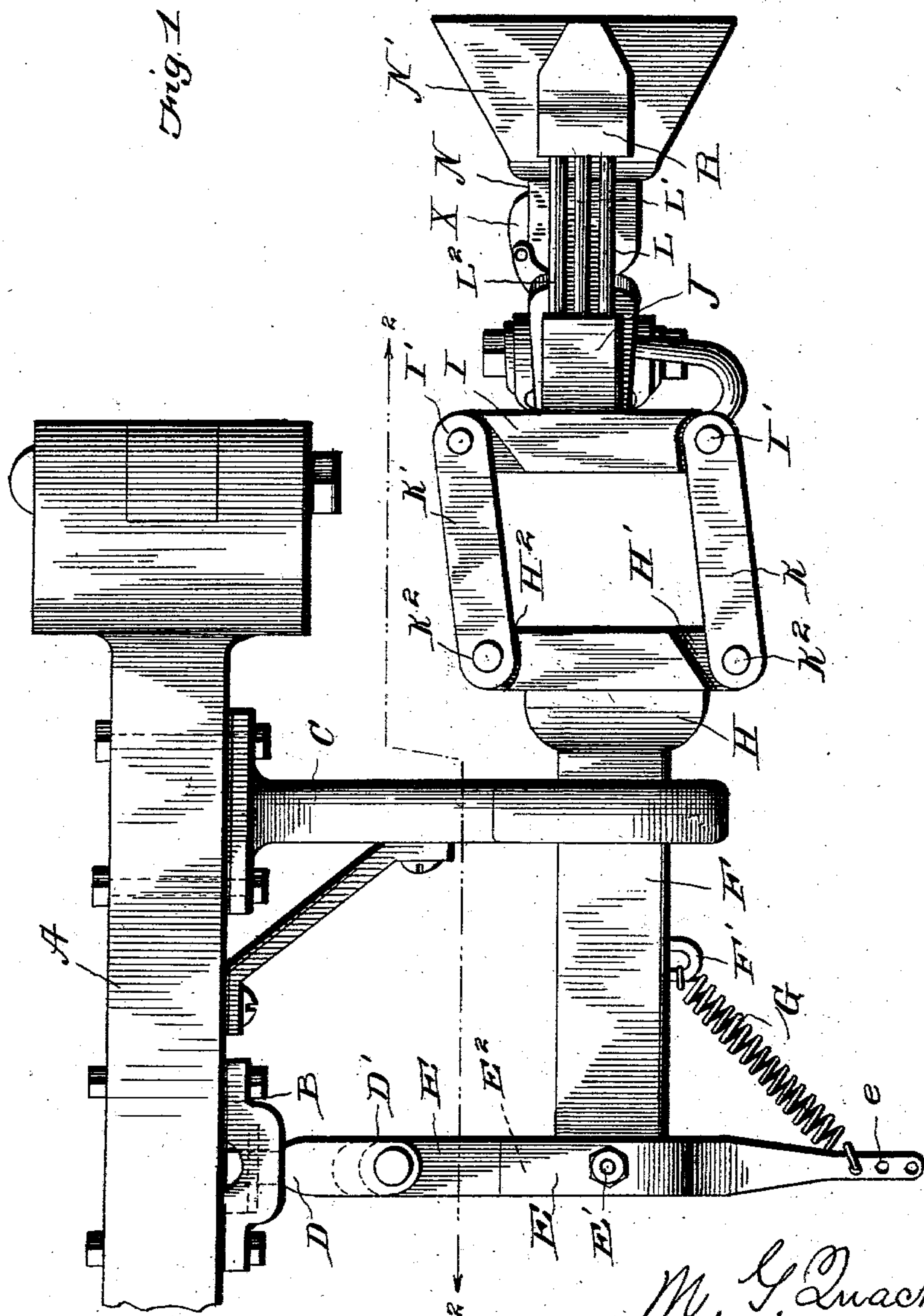
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M. G. QUACKENBUSH.  
FLUID PRESSURE COUPLING.

APPLICATION FILED MAR. 26, 1903.

NO MODEL.

2 SHEETS--8HEET 1.



## Witnesses

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# UNITED STATES PATENT OFFICE.

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## FLUID-PRESSURE COUPLING.

SPECIFICATION forming part of Letters Patent No. 743,659, dated November 10, 1903.

Application filed March 26, 1903. Serial No. 149,725. (No model.)

*To all whom it may concern:*

Be it known that I, MARSHALL G. QUACKENBUSH, a citizen of the United States, residing at Colorado Springs, in the county of El Paso and State of Colorado, have invented certain new and useful Improvements in Fluid-Pressure Couplings; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in automatic couplers for steam, air, and fluid hose-pipes for use in connection with air-brakes, steam-pipe connections, &c.; and it consists in the provision of means whereby pipes may be coupled without the necessity of a person going between the ends of cars, as is now commonly the custom and which results in great loss of life and various accidents.

The invention more specifically comprises an automatic coupling apparatus of this character comprising an adjustable funnel-shaped guide member adapted to receive a plunger having ducts which communicate with pipes and in the provision of a device whereby the ducts of the plunger are thrown into communication with fluid-pressure pipes and valves automatically actuated for opening communication between the train-pipes and the pipes upon two cars which have been automatically coupled.

The invention consists, further, in various details of construction and in combinations and arrangements of parts, which will be hereinafter fully described and then specifically defined in the appended claims.

My invention is illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this application, and in which drawings—

Figure 1 is a side elevation of my improved coupler, shown as attached to the draw-head of a car-coupler. Fig. 2 is a top plan view of two couplers connected together, portions of the couplers being shown in section. Fig. 3 is an end view of the coupler, and Fig. 4 is

a cross-sectional view on line 4 4 of Fig. 2. Fig. 5 is a detail sectional view showing parts of the invention in side elevation.

Reference now being had to the details of the drawings by letter, A designates the draw-head of a car-coupler, and secured to the under face thereof are the brackets B and C, which support the fluid-pressure-pipe-coupling apparatus. Swivelly mounted upon and depending from the bracket B is a forked yoke D, the arms of which carry a pivotal pin D', upon which is pivotally mounted a slotted bar E. Mounted upon a pivotal pin E', which is supported in the walls of the slotted portion E<sup>2</sup> of said bar, is a draw-bar F, having a staple F' secured to its under edge, to which one end of a spring G is connected, the other end of the spring being fastened in an aperture e in the lower tapering end of said bar E. The lower end of the bracket-arm C has an opening through which the draw-bar F has a passage and has a lateral play, the marginal ends of said opening being illustrated by dotted lines C' in Fig. 2 of the drawings. Said draw-bar F has a head H, having shouldered portions H' and H<sup>2</sup> on either edge thereof, said shoulders H<sup>2</sup> being slightly concaved, while the shoulders H' are disposed at an angle, as illustrated in Fig. 1 of the drawings. Links K and K' are mounted upon pivotal pins K<sup>2</sup> adjacent to said shoulders, and the forward ends of said links are in turn pivoted to a block I, which carries pins I' adjacent to the shouldered portions of said block I, said shoulders being provided for the purpose of allowing a limited vertical movement to the links. Said block I has secured thereto a cross-bar J, one end of which supports the pipes L and the other end of which is forked to receive the shank portion N of the funnel-shaped guide member N', said shank portion N being mounted upon a pivotal pin M, Fig. 2 of the drawings, and projecting laterally from one side of the shank portion N is a lug N<sup>2</sup>, adapted to bear against a spring-actuated plunger N<sup>3</sup>, which is mounted in a hole in said cross-bar J. The inner end of said plunger N<sup>3</sup> has a head adapted to bear against a spring n, interposed between said head and the bottom of the hole in which the plunger is mounted, and serves to hold



the funnel-shaped member in a position to receive the coupling-plunger carried by the end of an adjacent car.

Projecting from the bar J is a bracket O, 5 provided to support the pipes L, L', and L<sup>2</sup>, the ends of said pipes passing through apertures in the side wall of the shank portion N of said funnel-shaped member, the latter and said shank portion being hollow. A detail 10 view of the connections of one of said pipes with said shank portion is shown in Fig. 2 of the drawings. The slots through which the ends of said pipes enter the shank portion N are somewhat elongated in horizontal plane 15 in order to allow for the slight lateral movement of the funnel-shaped member.

Mounted in a recessed portion in the inner inclined face of the funnel-shaped member is a roller P, and Q designates a brace which 20 is secured to the cross-bar J by means of a bolt Q' or other suitable fastening means, and the outer end of said brace is secured at Q<sup>2</sup> to the plunger-head R, adapted to enter the funnel-shaped member of an adjacent coupling-head. Said coupling-head R has ducts 25 R', one of which is shown in Fig. 2 of the drawings, which open through one end of the plunger-head and through one of the longitudinal faces thereof, and the angled ends of 30 said pipes are adapted to enter said ducts in the plunger-head, and when two cars equipped with my improved fluid-pressure couplers come together said brace members Q will come in contact with the rollers P, one in 35 each funnel-shaped guide member, and will cause the same to be thrown laterally, so that the ends of the pipes will come into contact with the adjacent face of the plunger-head R about the margins of the ducts R', a suitable gasket L<sup>5</sup> being interposed between the 40 ends of said pipes and the ducts in the plunger-head, thus forming a means of communication between the ducts and said pipes.

Pivotaly mounted upon an arm N<sup>5</sup>, which 45 projects rearwardly from the pivotal end of the shank portion N, is a plunger S, which has a longitudinal play in a hole S' in the pressure-cylinder S<sup>2</sup>, a detail view of which is shown in Fig. 4 of the drawings. Said cylinder S<sup>2</sup> is mounted upon a pivotal pin S<sup>3</sup>, 50 Fig. 2 of the drawings, and fixed upon the bracket-arms S<sup>4</sup>, carried by the plate I. Said cylinder has a diametrically opposite passage-way T, Fig. 4 of the drawings, contracted at 55 its middle portion, as at T', and bisects said hole S' at right angles. Said plunger S has an aperture S<sup>8</sup>, which may be brought into registration with the passage-way T to allow communication through the cylinder. Fastened at locations diametrically opposite 60 about the circumference of said cylinder are the bosses W, to which the pipes S<sup>4</sup> and S<sup>5</sup> are connected, said pipe S<sup>4</sup> being adapted to be connected with the train-pipe, while the pipe 65 S<sup>5</sup> is designed to be connected with the pipe L<sup>2</sup>, thus forming means of communication from one section of a train-pipe to that of

another car when two couplers carried by cars are brought together and connected, and thus producing a pressure upon the plunger 70 which will bear against the pivotal end of the funnel guide and assist in holding the coupling ends of the pipe and plunger together.

Mounted upon the pivotal pin X' on the 75 shank portion of each funnel guide member is a catch X, one end of which has a play in a slot X<sup>2</sup> in the wall of the shank portion of the funnel guide, and the other end of the catch is adapted to normally engage a notch 80 J<sup>2</sup> in the bar J when the device is uncoupled, thus holding the funnel guide locked against lateral movement. The forward free end of the catch X is positioned in the path of the plunger R, and as said plunger enters the 85 funnel guide of an adjacent coupler and after the free end of the plunger passes by the ends of the pipes entering the elongated apertures in the walls of the funnel guide member the edge of the plunger coming in con- 90 tact with the catch will cause the same to tilt, throwing its rear end out of the notch and allowing the funnel guide member to move laterally upon its pivot. By this means it will be observed that the funnel-shaped 95 member is held rigid until the couplers come together, after which a free lateral motion is allowed the same.

In the present invention I have shown three pipes, as described, the top one, L<sup>2</sup>, being pro- 100 vided for the direct-pressure air, pipe L' for the vacuum-pressure air, and the lower one (indicated by letter L) being for conveying steam for heating purposes.

From the foregoing it will be observed that 105 when two cars equipped with similarly-constructed fluid-pressure coupling apparatus come together the plungers R, mounted upon said pipe, will enter the flaring ends of the funnel guides, and the braces Q will contact 110 with the antifriction-rollers P, and the plunger coming in contact with an antifriction-roller P' will throw its opposite face so that the ducts therein will register with the ends of the pipes which pass through the wall of 115 the funnel guide, and the coupling is effected. It will also be observed that by the peculiar arrangement of my improved apparatus both a lateral and vertical play are provided for to adapt the same for use in connection with 120 different makes of cars, by which coupling devices may be positioned at different locations. A lateral movement of the funnel-shaped member will cause the piston S, which is connected to the pivotal end of the shank 125 portion N, to be moved in the pressure-cylinder S<sup>2</sup>, and the fluid-pressure will bear upon the piston and assist in holding the funnel guides in contact with the pipes which pass through the wall thereof. When the cars 130 equipped with my apparatus are uncoupled, the spring-actuated plunger N<sup>3</sup> will cause the funnel-shaped guide member to be thrown slightly to the opposite direction from that



imparted to the funnel-shaped guide member when the same is coupled, and by the provision of the spring G means is provided for allowing the parts as they are coupled to yield slightly against the impact of the parts coming together.

It will be observed that by the provision of the air-pressure cylinder S<sup>2</sup> additional means is provided for holding the inner ends of the pipes in contact with the plunger by means of the pressure exerted upon the piston S, as described.

While I have shown a particular construction of apparatus embodying the features of my fluid-pressure coupling, it will be understood that I may make alterations in the detailed construction of the same without departing from the spirit of the invention.

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

1. A fluid-pressure coupler comprising a vertically and laterally adjustable funnel-shaped guide member adapted to be carried by a car, pipes entering apertures in the hollow shank portion of said funnel guide, a plunger having ducts opening through one end and one side thereof and supported on the other end of said pipes, and an inclined member connected to said plunger, a train-pipe, automatically-operated valve mechanism in passage-ways intermediate the train-pipe and the coupler-pipes, said funnel-shaped guide adapted to be moved laterally as a plunger of an adjacent coupler enters said funnel-shaped guide, and an inclined member secured to said plunger actuating the funnel-shaped member laterally to throw the pipes which enter the shank portion thereof into communication with the ducts opening through the side of the plunger, as set forth.

2. A fluid-pressure coupler comprising a funnel-shaped guide, a cross-piece on which said member is pivotally mounted, stationary pipes carried by said cross-pieces, the ends of which enter apertures in the wall of the shank portion of the funnel-shaped member, a plunger-head secured to the other ends of said pipes and having ducts opening through one end thereof and through the face of the plunger-head adjacent to said funnel-shaped member, an inclined brace carried by said cross-bar and fastened adjacent to said plunger-head, said funnel-shaped member adapted to be given a lateral movement by the contact with the inner inclined wall thereof with one of said inclined braces of an interlocking coupler-head, whereby the ducts opening through the side of the plunger-head may be thrown into contact with the inner ends of the pipes which pass through the shank portion of the funnel-shaped member, a train-pipe and communicating passage-ways between the same and one of said coupler-pipes, and means for automatically opening communication between the train-pipe and one of

said coupler-pipes as the couplers are connected, as set forth.

3. A fluid-pressure coupler comprising a funnel-shaped guide, a cross-bar to which the shank portion of said guide member is pivoted, a spring-plunger carried by said cross-bar and bearing against a projecting portion upon said funnel-shaped member, apparatus for supporting said funnel-shaped member upon a car and adapting the same to have a vertical and lateral motion, pipes supported by said cross-bar and having a play in apertures in the shank portion of the funnel-shaped member, a plunger-head supported on the other end of said pipes and having ducts leading through the same and with which said pipes communicate, an inclined brace secured to said cross-bar and fastened to said plunger-head, a pressure-cylinder, pipes communicating with the passage-way through said cylinder, a piston-valve mounted in said cylinder and having pivotal connection with the shank portion of said funnel-shaped guide, the apparatus so arranged that when the plunger-head of a coupler enters the funnel-shaped member, the latter will be given a lateral movement to bring the inner ends of the pipes which enter the shank portion of the funnel-shaped member into communication with ducts in the adjacent plunger, and automatically open the valve in the pressure-cylinder, whereby the fluid-pressure will act upon the piston and tilt the funnel-shaped guide member, as set forth.

4. A fluid-pressure coupling for trains, comprising a funnel-shaped guide member, a cross-piece on which the same is mounted, pipes carried by said cross-piece and having ends which are adapted to have a play through apertures in the side walls of the shank portion of the funnel-shaped member, a plunger-head having ducts therein mounted on the other ends of said pipes, an inclined member fastened to said cross-piece at one end and its other end fastened to said plunger, a vertically and laterally movable head to which said cross-piece is connected, a pressure-cylinder pivotally mounted upon said cross-piece securing the head and having a diametrically-disposed passage-way through the same, a piston-plunger having a play in said cylinder and pivoted at one end to a projection on the shank portion of the funnel-shaped member, as set forth.

5. A fluid-pressure coupler comprising a plate adapted to be secured to the draw-bar of a car-coupler, bracket-arms secured thereto, a draw-head supported by said bracket-arms and adapted to have a lateral and a vertical play, a funnel-shaped guide member, a cross-piece supporting the same, link connections between said cross-piece and said draw-head, pipes secured to said cross-piece and having a play in apertures in the hollow portion of the funnel-shaped member, a plunger-head having ducts therein with which the



opposite ends of said pipes communicate, an inclined member secured to said cross-piece at one end and its other end to said plunger, a pressure-cylinder, a piston-valve mounted therein and pivotally connected to the shank portion of the funnel-shaped member, pipes communicating with a diametrically-disposed passage-way in said cylinder, one of said pipes communicating with a train-pipe and the other with a pipe of the coupler-head, as set forth.

6. A fluid-pressure coupler comprising a pivotal spring-actuated funnel-shaped member having elongated apertures in the side walls thereof, a cross-piece supporting said funnel-shaped member, pipes supported by said cross-piece and having a play in the apertures of the shank portion of the guide member, a latch pivoted in a slot in said shank portion and serving to lock said guide member from lateral movement when uncoupled, a tapering plunger-head mounted on the other ends of said pipes, ducts leading through said plunger and communicating with the opposite ends of said pipes, an inclined member secured between said cross-piece and the plunger, a pressure-cylinder, a diametrically-disposed passage-way through said cylinder, a piston-valve working at right angles to said passage-way pivoted to the shank portion of the funnel-shaped guide,

communicating passage-ways between said cylinder and one of said coupler-carrying pipes and the train-pipe, as set forth.

7. A fluid-pressure coupler comprising a plate adapted to be secured to the draw-bar of a car-coupler, a fixed and a pivotal bracket member secured to said plate, a draw-bar pivotally mounted upon said swiveled bracket and guided in an aperture in the fixed bracket, and fluid-pressure coupling mechanism supported by said draw-bar, as set forth.

8. In combination with the draw-head of a car-coupler, a plate secured thereto, a fixed and a swiveled bracket secured to said plate, a bar pivotally mounted upon said swiveled member, a draw-bar pivotally connected to said bar, a spring secured at one end to the latter and at its other end to said draw-head, the lower end of the fixed bracket having a guideway in which said draw-bar has a lateral play, a funnel-shaped guide member, a coupling plunger-head, a cross-piece supporting said funnel-shaped member and plunger-head, and link connections between the same and said draw-head, as set forth.

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

MARSHALL G. QUACKENBUSH.

Witnesses:

TILMON L. STANLEY,  
E. J. KELSEY.