

No. 833,702.

PATENTED OCT. 16, 1906.

C. H. TOMLINSON.
AUTOMATIC FLUID COUPLING.

APPLICATION FILED SEPT. 22, 1905.

3 SHEETS—SHEET 1.

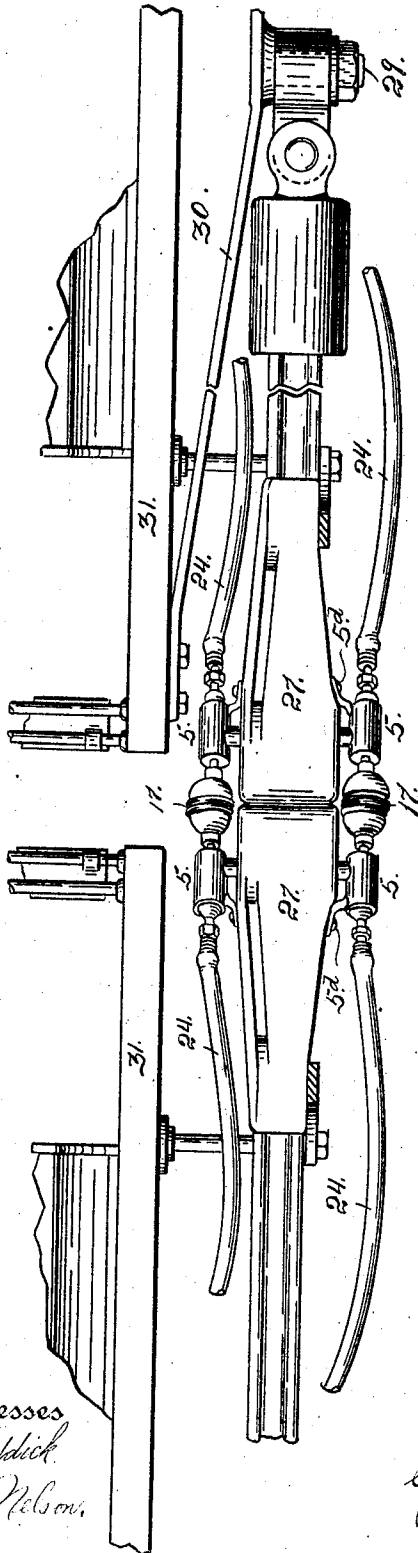


Fig. 1.

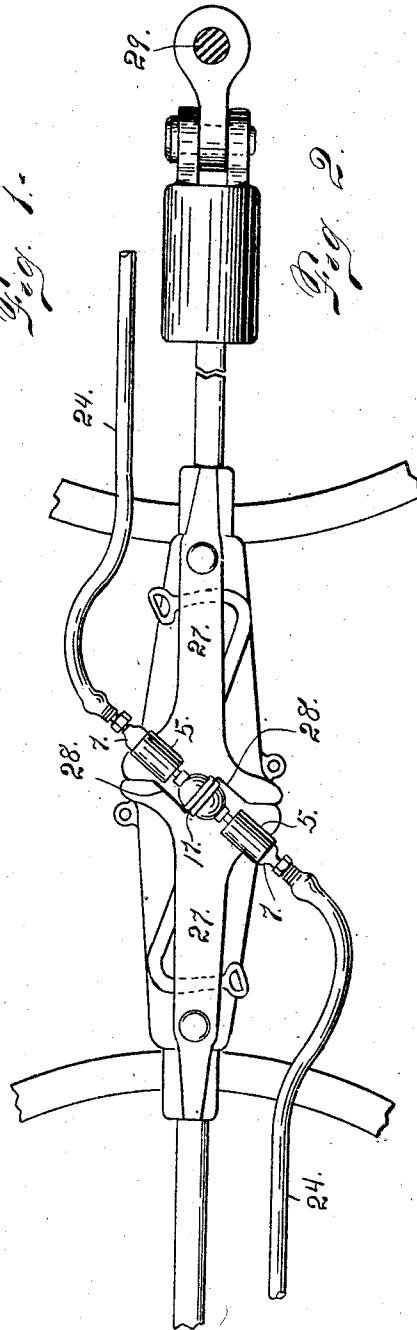


Fig. 2.

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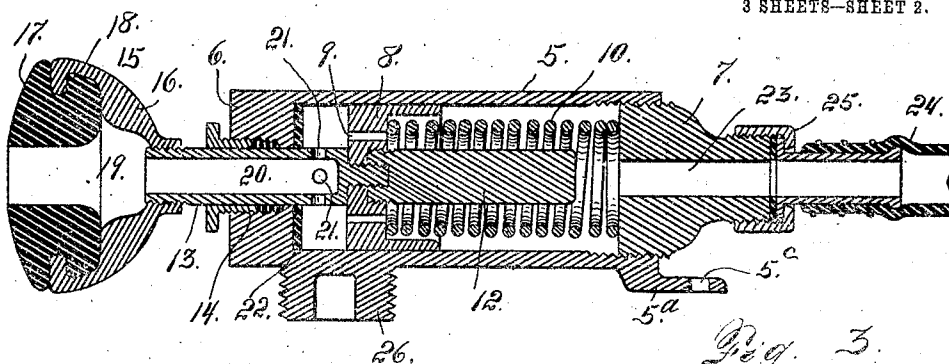


Fig. 3.

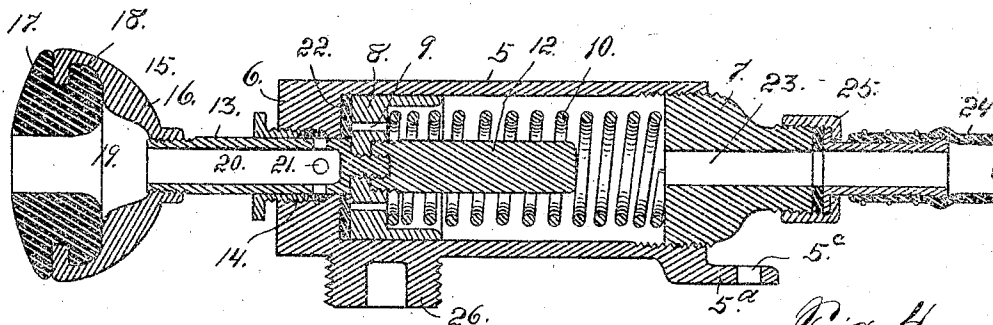


Fig. 4.

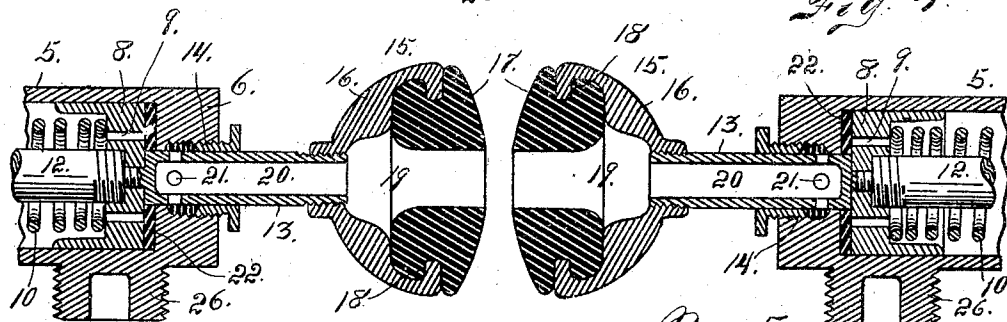


Fig. 5.

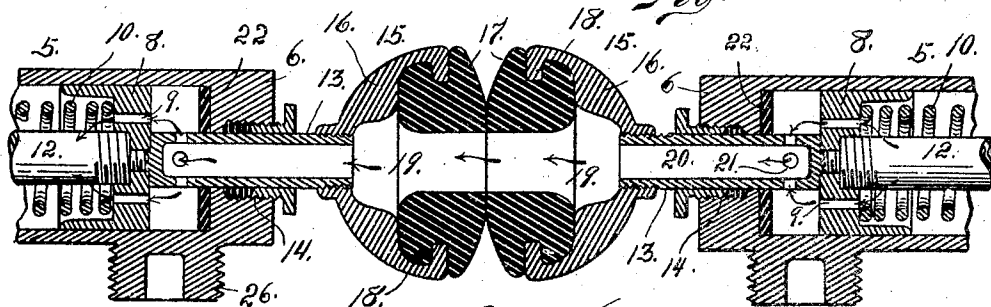


Fig. 6.

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3 SHEETS—SHEET 3.

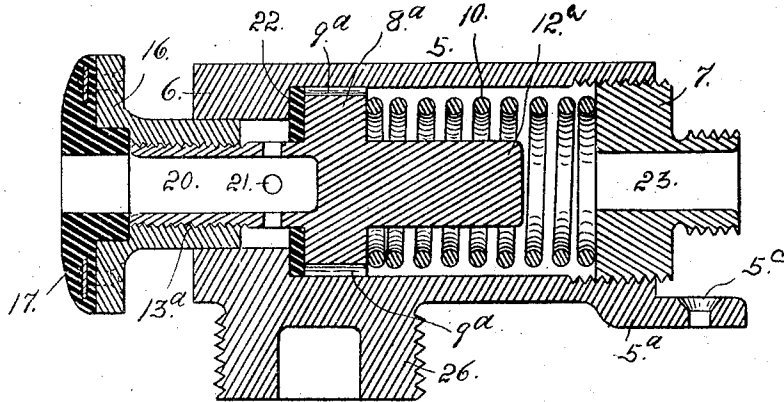


Fig. 7.

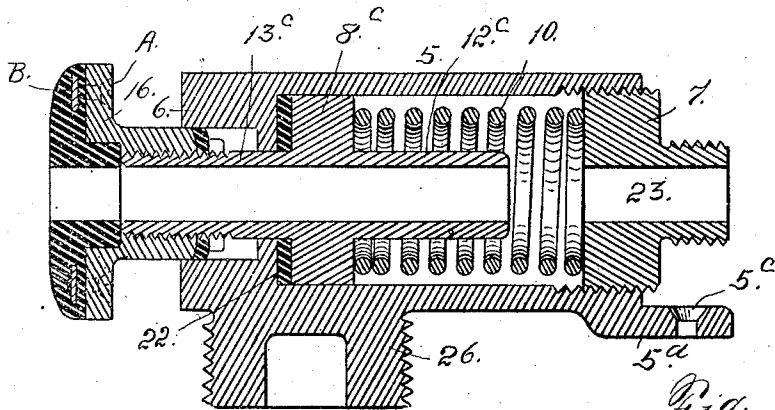


Fig. 8

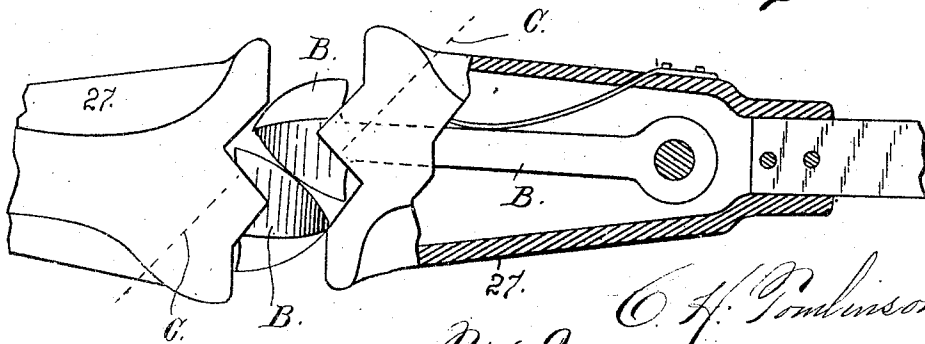


Fig. 9

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UNITED STATES PATENT OFFICE

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AUTOMATIC FLUID-COUPLING.

No. 833,702.

Specification of Letters Patent.

Patented Oct. 16, 1906.

Application filed September 22, 1905. Serial No. 279,623.

To all whom it may concern:

Be it known that I, CHARLES H. TOMLINSON, a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Automatic Fluid-Couplers; 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 and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in automatic fluid-couplers adapted for use with radiating draw-bars or bars whose rear extremities are pivotally connected with their respective cars, these draw-bars being of the character used in street-car service, whereby it becomes practicable to make short turns, as at street-corners.

My improved fluid-coupler is adapted for use with draw-bars having neither lateral or vertical movement when coupled. Draw-bars of this construction are shown in my previous applications filed December 9, 1904, and February 10, 1905, having Serial Nos. 236,091 and 245,043, respectively. These draw-bars have notched abutting heads, whereby when coupled independent lateral movement becomes impossible and the two draw-bars are always in direct alinement as well while making turns, however short, as on a straight track. Neither do the draw-bars have independent vertical movement, since the draw-bars are hollow and provided with cooperating coupling devices, which protrude from the draw-heads in front, whereby each coupling device when the draw-bars are in the coupled relation enters the forward extremity of the opposite draw-head, thus preventing independent vertical movement.

By the term "fluid-coupler" I mean a coupler adapted for use with either air, steam, or other fluid. As shown in the drawings, two fluid-couplers are shown one located above and the other below the draw-heads. One of these is calculated for use with what is known as "straight" air and the other with what is known as "automatic" air. Attention is called to the fact that in street-

car service where the cars are coupled in trains of two or more air-brakes are quite generally employed at the present time. What is known as "straight" air is more generally used, but automatic air may of course be employed.

Having briefly outlined my improved construction as well as the function it is intended to perform, I will proceed to describe the same in detail, reference being made to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a side elevation of two coupled draw-heads equipped with my improvements, a fragmentary view of two cars being shown, upon which the draw-bars are mounted. Fig. 2 is a top plan view of the two draw-heads equipped as aforesaid, the pivot-pin upon which one of the draw-heads swings being shown in section. Fig. 3 is a sectional view in detail of one of the fluid-coupling members, the same being shown in the open position or in the position to allow straight air to pass between the cars when coupled. Fig. 4 is a similar view, but with the valve closed, showing its position when the cars are uncoupled, whereby the air is automatically prevented from escaping. Fig. 5 is a fragmentary view of the two fluid-coupling members shown in position just before reaching the abutting position. Fig. 6 is a similar view showing the members in abutting relation and with both valves open to allow the air to circulate between trains. Fig. 7 is a modified form of coupling member adapted to perform the same function as the construction shown in Figs. 3 to 6, inclusive. Fig. 8 is a coupling member adapted for use with automatic air or constructed to allow the air to escape when the cars are uncoupled for brake-setting purposes. Fig. 9 is a fragmentary view of two draw-heads, illustrating their coupling devices in contact and showing the manner in which the radial draw-bars are shifted laterally during this stage of the coupling operation.

The same reference characters indicate the same parts in all the views.

I will first describe one of the fluid-coupling members adapted for use with straight air, the form being that shown in Figs. 3 to 6, inclusive. Let the numeral 5 designate a cyl-

inder having a front head 6 integral with the body of the cylinder and a rear head 7 secured thereto. This cylinder is hollow and provided with a piston-valve 8, slidably mounted in the cylinder and provided with orifices 9 to allow the air to circulate between the two compartments of the cylindrical chamber when the valve is open or in the position shown in Figs. 3 and 6. Within the cylinder 5 is located a coil-spring 10, surrounding the stem 12 of the valve 8. One extremity of this spring bears against the plug 7, while the other extremity acts on the piston-valve and by virtue of its tension normally holds the said valve closed. Also connected with the piston-valve is a hollow stem 13, which, as shown in the drawings, is threaded into the valve 8 and the stem 12. Attention is called to the fact that the parts 8, 12, and 13 may all be formed in one piece or integral, as shown in Fig. 7. The hollow stem 13 passes through a stuffing-box 14, inserted in the front head of the cylinder. To the forward extremity of the stem 13 is attached a coupling-head 15, composed of a rear metal member 16 and a forward cushion member 17, the two members being suitably interlocked, as shown at 18. The members of the coupling-head 15 are provided with an opening 19, registering with the opening 20 of the stem 13. The rear extremity of this hollow stem is provided with orifices 21, whereby communication is established with the cylinder-chamber when the piston-valve is moved to the position shown in Fig. 3. The forward extremity of the piston-chamber is provided with a packing-washer 22 in order to form a tight joint when the valve is closed or in the position shown in Fig. 4. The rear cylinder-head 7 is provided with a central opening 23, the said head being connected with the air train-pipe 24 by means of a suitable coupling 25. The cylinder 5 is provided with a depending exteriorly-threaded part 26, adapted to screw into a threaded recess formed in the top of one of the draw-heads 27, whereby the fluid coupling member is rigidly connected with a draw-head member. The fluid coupling members are so mounted on the draw-heads that when the latter are interlocked or coupled the pressure of the fluid coupling-heads will be sufficiently forceful to cause the piston-valves on the two coupling members to be forced rearwardly against the tension of their springs 10, whereby the valves are opened, allowing the air to circulate freely between the cars, as shown in Fig. 6. The position of the piston-valves immediately before the cars are coupled or after they are uncoupled is illustrated in Fig. 5.

The construction shown in Fig. 7 is substantially the same as that just described, except that the parts designated 8, 12, and 13 form an integral device. For this reason these corresponding parts will be designated

8^a, 12^a, and 13^a, respectively. The orifices in the valve member 8^a really form grooves in the periphery of the valve and are designated 9^a. The other elements are given the same reference characters as in Figs. 3 to 6, inclusive, since they only differ slightly in shape. In Fig. 7, however, the cushion-head 17 and the metal part 16 are connected by screws A, inserted in flat metal rings B, embedded in the cushion members 17.

In the form of construction shown in Fig. 8 the valve may be designated 8^c, the rearwardly-protruding stem 12^c, and the forwardly-protruding stem 13^c. In this form of construction the two stem parts 12^c and 13^c are hollow, and the valve 8^c is provided with a central passage forming a continuous opening, whereby the air is allowed to circulate freely when the members are coupled and to escape automatically when they are uncoupled for brake-setting purposes where what is known as "automatic" air is employed.

Each cylinder is provided with a depending clip 5^a at its rear extremity, the same being provided with an opening 5^c for the introduction of a bolt 5^d or other suitable fastening device to aid in securing the cylinder to the draw-bar. The relative position of the fluid coupling members mounted on the draw-bars is illustrated in Figs. 1 and 2. As heretofore stated, the forward or abutting extremities of these draw-heads are notched or provided with interlocking recesses, as shown at 28 in Fig. 2.

It has been found advisable to mount the fluid-coupling members on their respective draw-bars, so that they shall occupy positions diagonal to the line of the draw-bars. It has been found that these fluid coupling members cooperate with each other and perform their function to much better advantage when mounted in this manner. In this construction of draw-head by virtue of the action of the spring-retained devices D within the draw-heads the two draw-heads are usually thrust laterally in opposite directions immediately preceding the coupling act. (See Fig. 9.) However, as they come together they assume the position shown in Fig. 2, whereby they are in correct alignment. By virtue of the fact that they are usually slightly out of alignment immediately preceding the completion of the coupling act if the fluid coupling members were arranged so that their axes coincided with the longitudinal direction of the draw-bars the coupling-heads of the fluid members would first come in contact slightly out of alignment, whereby the opening 19 through these heads would be left partly open. When, however, the draw-heads assume their proper position in alignment with each other, the fluid coupling-heads would not readily shift by virtue of the engagement of

the cushion parts, since the friction between these parts is found in practice to prevent a lateral shift sufficient to close the openings 19. It has therefore been found advisable to

5 arrange the coupling members diagonal to the draw-heads, in which event the coupling-heads of the fluid members will assume their proper relation, as shown in Figs. 1 and 2, under the circumstances heretofore explained.

10 Attention is called to the fact that the radiating draw-bars are pivotally connected at their rear extremities with a depending stud 29, connected with a bar 30, rigidly attached to the platform 31 of the car.

15 In Fig. 9 the dotted line C indicates the direction of the axes of the fluid coupling-heads, which are not shown in this view.

Having thus described my invention, what I claim is—

20 1. In an automatic fluid-coupler for use with cars having radiating draw-bars, the combination with the radiating draw-bar and the train-pipe through which the fluid passes, of a spring-actuated coupling-head, a cylinder mounted on the draw-head and movable therewith; and a valve located in the cylinder and connected in operative relation with the coupling-head and arranged to control the passage of fluid from the train-pipe

25 through the head, the valve being closed when the draw-head is uncoupled but kept open by the pressure of the coupling-heads when the cars are in the coupled position, the coupling-head having a passage communicating with the train-pipe when the valve is

30 open.

2. In a fluid-coupler for cars, the combination with the draw-head of the car and the fluid train-pipe, of a spring-held coupling-head having a passage communicating with the train-pipe, a cylinder mounted on the draw-head and a valve located in the cylinder for controlling said passage, the said valve being connected in operative relation

40 with the coupling-head, the valve being closed when the cars are uncoupled, but open when the cars are in the coupled relation by virtue of the pressure of the fluid coupling-head upon its cooperating or companion

45 head connected with the opposite car.

3. In a fluid-coupler for cars, the combination with the radiating draw-head of the car and fluid train-pipe, of a spring-actuated fluid coupling-head whose outer extremity is composed of elastic material, the coupling-head having an opening communicating with the train-pipe and registering with the corresponding opening of the companion fluid coupling-head of the opposite car when the

55 cars are in the coupled relation, a cylinder mounted on the draw-head and a piston-valve located in the cylinder and connected in operative relation with the fluid coupling-head.

65 4. In fluid-coupler for cars, the combina-

tion with a cylinder mounted on the car, a piston-valve located in the cylinder, a spring also located in the cylinder and normally acting on the valve to close the latter, and a cushion coupling-head connected with the

70 piston-valve and protruding beyond the cylinder, the coupling-head having an opening therethrough for the purpose set forth.

5. In a fluid-coupler for cars, the combination with the fluid train-pipe, of a cylinder communicating with said train-pipe, a piston-valve located in the cylinder, a spring acting on the piston and normally holding the same at its forward limit of movement, and a cushion coupling-head connected with

80 the piston and extending forward of the cylinder, the said head having an opening communicating with the train-pipe for the purpose set forth.

6. The combination with a radiating draw-bar and the fluid train-pipe, of a receptacle communicating with the train-pipe and mounted on the draw-head, a piston movable in said receptacle, a spring located in the receptacle and acting on the piston having a tendency to hold the latter at its forward limit of movement, and a cushion coupling-head connected with the piston and extending beyond or forward of the receptacle for the purpose set forth.

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7. In a fluid-coupler for cars, the combination with the draw-bar and fluid train-pipe, of a cylinder rigidly mounted on the draw-bar and communicating with the train-pipe, a piston-valve located in the cylinder, the said valve having a rearwardly-protruding stem, a coil-spring located in the cylinder surrounding the said stem and acting on the piston to normally hold the latter in the forward position, and a cushion coupling-head

100 connected with the piston and located forward of the cylinder, the said coupling-head having an opening for the passage of the fluid from the train-pipe.

8. In a fluid-coupler for cars, the combination with the fluid train-pipes and radiating draw-heads of the cars, of yieldingly-retained fluid coupling-heads mounted on the cars and having registering openings for the passage of the fluid from the train-pipes when the

110 cars are coupled, the said heads having cushion-engaging extremities, of a receptacle connected with each draw-head and mounted thereon, and a piston-valve connected in operative relation with each of the cushion-heads for the purpose set forth.

9. In a fluid-coupler for cars, the combination with the fluid train-pipes and radiating draw-heads of the cars, of yieldingly-retained fluid coupling-heads mounted on the cars and arranged to engage each other when the cars are coupled, the said heads having registering passages communicating with the train-pipes, fluid-receptacles mounted on the draw-heads and valves located in the fluid-receptacles

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and connected with the heads for controlling the passage of fluid from the train-pipes to the registering openings of the heads.

5 10. In a fluid-coupler, the combination with radiating draw-bars and fluid train-pipes; of fluid coupling-heads having openings adapted to register when the cars are coupled, the said openings permitting the passage of the fluid from the train-pipes, the
10 fluid coupling-heads being so positioned on the draw-bars that their axes form oblique angles with the direction of the draw-bars for the purpose set forth.

15 11. The combination with a radiating draw-bar having a spring-actuated coupling-hook protruding from the draw-bar in front, of a cushion fluid coupling-head mounted on the draw-bar and occupying a position diagonal to the length of the draw-bar, the said

fluid coupling-head having an opening for 20 the passage of fluid, substantially as described.

12. In a fluid-coupler, the combination with draw-bars and fluid train-pipes, of fluid coupling-heads having openings adapted 25 to register when the cars are coupled, the said openings permitting the passage of the fluid from the train-pipes, the fluid coupling-heads being so positioned on the draw-bars that their axes form oblique angles with the 30 direction of the draw-bars.

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

CHARLES H. TOMLINSON.

Witnesses:

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CLARE KENYON.