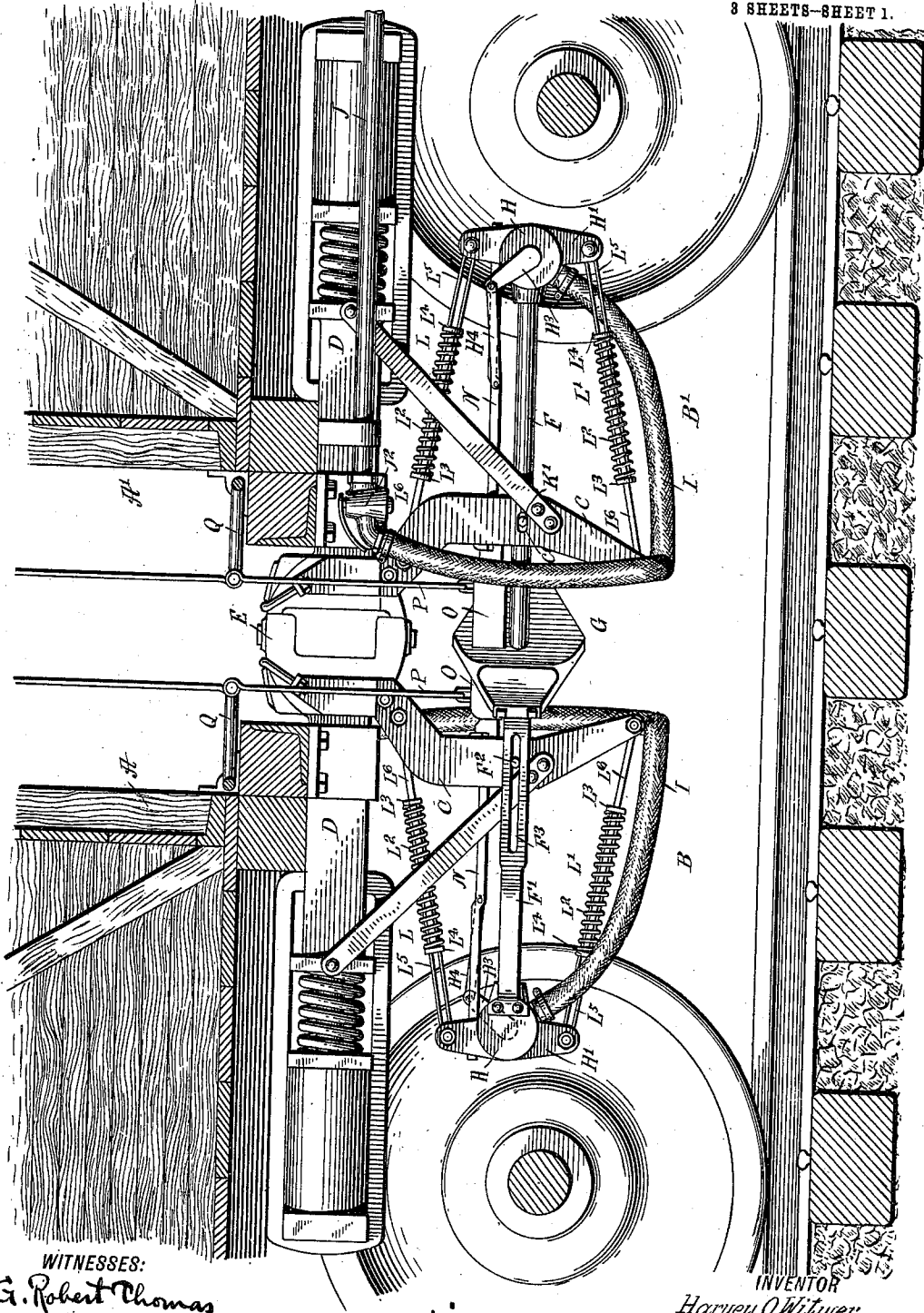


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H. O. WITWER.  
TRAIN PIPE COUPLING.  
APPLICATION FILED JAN. 15, 1910.

Patented Dec. 6, 1910.

3 SHEETS-SHEET 1.



WITNESSES:  
G. Robert Thomas  
Prof. Herstein

7-15-11

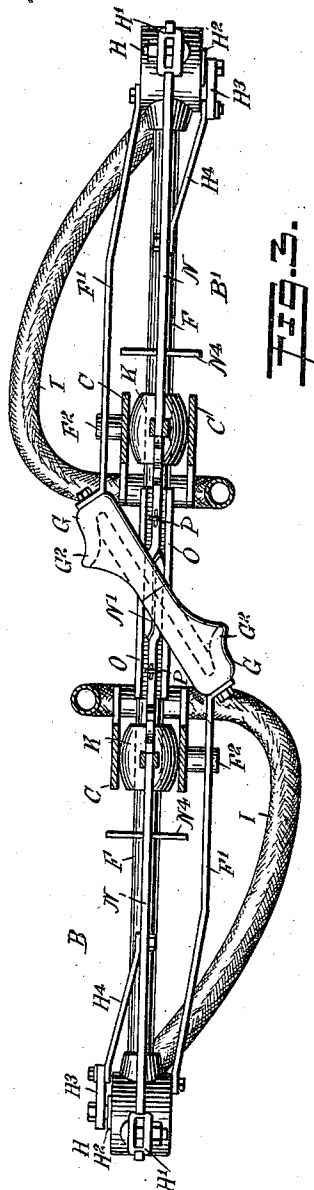
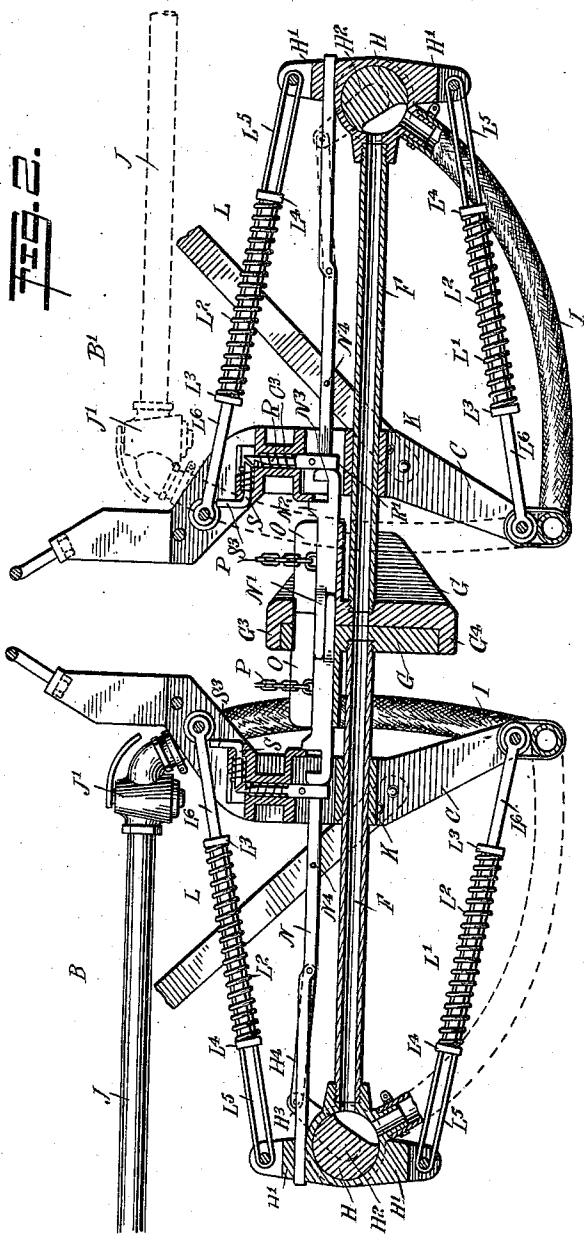
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3 SHEETS-SHEET 2.



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# UNITED STATES PATENT OFFICE.

HARVEY OLIVER WITWER, OF LETHBRIDGE, ALBERTA, CANADA.

## TRAIN-PIPE COUPLING.

977,917.

Specification of Letters Patent.

Patented Dec. 6, 1910.

Application filed January 15, 1910. Serial No. 538,180.

*To all whom it may concern:*

Be it known that I, HARVEY O. WITWER, a citizen of the Dominion of Canada, and a resident of Lethbridge, in the Province of Alberta and Dominion of Canada, have invented a new and Improved Train-Pipe Coupling, of which the following is a full, clear, and exact description.

The invention relates to railway cars having pipes for conducting fluid pressure, such as air and steam, from one car to another for braking, signaling, heating and other purposes.

The object of the invention is to provide a new and improved automatic train pipe coupling, arranged to insure an automatic coupling of the train pipes of two cars coming together, to cut off the fluid pressure in the train pipes on the cars being uncoupled, and to cause an emergency application of the fluid pressure brakes in case the cars accidentally break apart.

For the purpose mentioned, use is made of a coupling head attached to a coupling pipe moving bodily with the draw bar and having movement independent of the draw bar in both a longitudinal and a lateral direction, the coupling pipe being provided with a valve, controlled by the movement of the coupling pipe and its head.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the train pipe coupling as applied to two cars coupled together and shown in section; Fig. 2 is a sectional side elevation of the pipe coupling showing the two coupling members of adjacent cars coupled together; Fig. 3 is a plan view of the same, parts being in section; Fig. 4 is a front elevation of one of the coupling members in position on the car; Fig. 5 is an enlarged sectional side elevation of the locking and releasing device for the rod to control the valve in the coupling pipe; Fig. 6 is a plan view, partly in section, of opposite coupling members in open and non-coupling position; Fig. 7 is an enlarged face view, partly in section, of one of the coupling heads; and Fig. 8 is a perspective view of the valve-controlling rod having a forked coupling member.

The cars A, A' are provided at their ends

with fluid pressure coupling members B, B' mounted on supports or hangers C, C' depending from and moving bodily with the draw bars D, D mounted to slide in the usual manner on the cars A, A' and provided with coupling members E, E of any approved type. The coupling members B, B' are alike in construction and hence it suffices to describe but one in detail. A coupling pipe F terminates at its forward end in a coupling head G, and at its rear end is a valve H connected by a hose I with the train pipe J extending under the car A (A') in the usual manner, and provided with an angle cock J' normally open. The pipe F is mounted to slide in the direction of its length in a bearing K, provided on its sides with trunnions K' (see Fig. 6), extending in elongated slots C' formed in the side of the support or hanger C, so that the bearing K can swing up and down and with it the pipe F, and the bearing K can also turn in a lateral direction owing to the elongation of the slots C', as will be readily understood by reference to Fig. 6. The coupling pipe F and its coupling head G are normally held in a forward position by the action of spring devices L, L', connected at their rear ends to lugs H' projecting from the top and bottom of the valve H, and the said spring devices L, L' are connected at their forward ends to the support or hanger C, the spring device L extending upwardly and forwardly from the lug H' to the support C, while the spring device L' extends forwardly and downwardly from the lug H' to the support C. Each spring device L, L' consists of a spring L<sup>2</sup> pressed on at the ends by collars L<sup>3</sup>, L<sup>4</sup> held on rods L<sup>5</sup>, L<sup>6</sup> extending through the springs L<sup>2</sup> in opposite directions to connect with the lugs H' and the support C, respectively, as will be readily understood by reference to Figs. 1 and 2. The rear rods L<sup>5</sup> of the spring devices L, L' are preferably in the form of links having a sliding engagement with the lugs H'.

The spring devices L, L' operate in conjunction with a bar F' and pin F<sup>2</sup>, to hold the coupling pipe F, in the angular position shown in Fig. 6, that is, holding the pipe in a horizontal plane at an angle to the longitudinal center line of the car. The bar F' is secured at its forward end to the rear end of the head G, and the said bar F' is secured at its rear end to the valve H and

is provided between its ends with a lengthwise-extending slot  $F^2$ , into which projects the pin  $F^2$  extending transversely from the support C. When the cars are uncoupled, the pin  $F^2$  is at the rear end of the slot  $F^2$  and the spring devices L, L' are under sufficient tension to pull the pipe F to an angular position, the trunnions  $K'$  of the bearing K permitting such movement of the bearing K and its pipe F. The angular position of the pipe F in a transverse direction moves the coupling head G into what I prefer to call a secondary angle of approach, as indicated in Fig. 6. The bar  $F'$  also serves as a guide to prevent the pipe F and head G from revolving.

The valve H is provided with a valve plug  $H^2$  for connecting the hose I with the pipe F or disconnecting the same, and on one outer end of the valve plug  $H^2$  is secured an arm  $H^3$  connected by a link  $H^4$  with a valve-operating rod N, mounted to slide at its rear end in a bearing on the valve H, and projecting at its forward end into a guideway O formed on the back of the coupling head G and having an opening  $O'$  to the face of the coupling head G, as indicated in Figs. 2 and 7. The forward end of the rod N is provided with a coupling member  $N'$ , preferably in the form of a fork, the arms of which are out of vertical alinement, as plainly indicated in Fig. 8, so that when the cars A and A' are coupled together the members  $N'$  of the rods N of the two couplings B and B' interlock with each other, as plainly indicated in Figs. 2 and 3, so that one rod when raised or lowered causes the other rod to move with it in the same direction. The forward end of the rod N is connected by a link P with the manipulating device Q for the coupling E, so that the rod N is raised or lowered on actuating the device Q. The rod N is provided with stops  $N^2$ ,  $N^3$  and  $N^4$ , of which the stops  $N^2$ ,  $N^3$  operate in conjunction with a lug  $C^2$  formed on the support C (see Fig. 5), while the stop  $N^4$  is adapted to engage the rear side of the support C at the time the cars are uncoupled, and the members B and B' are disconnected from each other. The rod N slides in a bearing R' formed on the lower end of a pin R, extending vertically and mounted to slide in a suitable bearing  $C^3$  formed in the support C, as plainly indicated in Figs. 2 and 5. The pin R is pressed on by a spring  $R^2$ , to normally hold the rod N in a lowermost position, and the upper end of the pin R is provided with a beveled head  $R^3$ , adapted to be engaged by the beveled end  $S'$  of a pin S, mounted to slide lengthwise in a bearing  $C^4$  formed on the support C. The pin S is pressed on by a spring  $S^2$  and is provided with an upwardly extending arm  $S^3$  adapted to be engaged by the collar  $L^3$  of the spring device

L, to withdraw the pin S from engagement with the head  $R^3$ , to allow the spring  $R^2$  to move the pin R downward at the time the cars are uncoupled, as hereinafter more fully explained.

It is understood that when the device Q is actuated in coupling the draw bars D, D of adjacent cars A and A' together, the rod N is raised and in doing so, the pin R is caused to slide upward against the tension of its spring  $R^2$ , so that the beveled head  $R^3$  finally passes the beveled end  $S'$  of the pin S, to allow the latter to snap under the head  $R^3$ , thus holding the pin R and with it the rod N in an uppermost position.

The coupling head G is preferably in the form of a diamond, as indicated in the drawings, the forward half portion forming a shoe  $G'$ , while the rear end is provided with a pocket  $G^2$  and the rear half portion is provided on the face of the coupling head with guides  $G^3$ ,  $G^4$ , extending along the top and bottom margins of the rear portion of the head. The forward end of the pocket  $G^2$  is curved outwardly, so as to permit convenient entrance of the shoe  $G'$  of the opposing coupling head when the cars A and A' are coupled together, it being understood that when this takes place the top and bottom edges of the entering shoe are guided to position and engage the guides  $G^3$  and  $G^4$ , so as to insure a firm contact between the faces of the two coupling heads G of opposing cars and whereby the coupling heads are centered, that is, the coupling pipes F are moved into register with each other and likewise the openings  $O'$  of the guideways O of the two united coupling heads.

The operation is as follows: When the cars are uncoupled and approach each other for coupling, then the heads G stand in angular position, as indicated in Fig. 6, and when the shoes  $G'$  of the two coupling heads G engage each other, they press the heads laterally so as to finally bring the pipes F in alinement and in register with each other as soon as the heads G are firmly coupled together, that is, the shoes  $G'$  have passed into the pockets  $G^2$ . Now as the cars move farther together, the pipes F slide in their bearings K in opposite directions, so that the spring devices L and L' for each coupling member B, B' are placed under hard tension, and consequently the faces of the coupling heads G are firmly pressed together, and are held pressed together under the tension of the said spring devices L and L'. When the heads G of the two coupling members B and B' are coupled together, the coupling members  $N'$  of the rods N are likewise coupled together, and when the cars A and A' move into final coupling position, it is evident that the supports C move toward each other, and consequently the lugs  $C^2$  en-

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gage the stops  $N^2$ , whereby the rods  $N$  are shifted to turn the valve plugs  $H^2$  into the open position shown in Fig. 2, to connect the train pipes  $J$  of the adjacent cars  $A$  and  $A'$  with each other, and thus allow fluid pressure to pass from the train pipe of one car to the train pipe of the other car.

It is understood that when the cars  $A$  and  $A'$  are uncoupled, the valves  $H$  are closed, and when the cars are moving into coupling engagement the coupling heads  $G$ ,  $G$  are coupled together prior to the coupling of the draw heads  $D$ ,  $D$ , so that the spring devices  $L$ ,  $L'$  are placed under heavy tension when the cars are finally coupled together, and it will also be noticed that the final coupling movement of the draw heads  $D$ ,  $D$ , the supports  $C$  by their lugs  $C^2$  engaging the stops  $N^2$ , impart lengthwise movement to the rods  $N$ , to move the valves  $H$  into open position with a view to connect the train pipes  $J$ ,  $J$  of the cars  $A$ ,  $A'$  with each other.

When the cars are uncoupled and move apart with the rods  $N$  raised and the stop  $N^3$  opposite the lug  $C^2$ , the valves  $H$  are closed, to prevent the fluid pressure from passing out of the train pipes into the atmosphere by way of the now disconnected pipes  $F$ . It is understood that owing to the stop  $N^3$  engaging the lug  $C^2$ , the rod  $N$  is held against movement during the time the heads  $G$ ,  $G$  separate, so that the valves  $H$  are turned into closed position, and as the spring devices relax during the uncoupling, the collars  $L^3$  of the spring devices finally engage and press the arms  $S^3$  of the pins  $S$  and thus withdraw the pins  $S$  from the pins  $R$ , to allow the springs  $R^2$  thereof to force the pins  $R$  downward, and hence the rods  $N$ , to disengage the stops  $N^3$  from the lugs  $C^2$ . The rods  $N$  now move in unison with the pipes.

In case the cars  $A$ ,  $A'$  break accidentally apart and the rods  $N$  are not lifted prior to uncoupling of the cars, then the rods  $N$  move with the pipes  $F$ , as the stops  $N^3$  now clear the lugs  $C^2$  and hence the valves  $H$  remain open after the heads  $G$ ,  $G$  are disengaged, to allow air to escape from the train pipes  $J$ , with a view to apply the brakes for an emergency stop. When the stop pins  $N^4$  finally come in contact with the supports  $C$ , the valves  $H$  are partly closed, but this action is too late to prevent the emergency application of the brakes.

In case it is necessary to open a draw head of an uncoupled car, the operating device  $Q$  is manipulated and the valve operating rod  $N$  is raised, but as the pin  $S$  is held withdrawn from the pin  $R$  by the collar  $L^3$  of the spring device  $L$ , the pin  $R$  is not locked and drops, and with it the rod  $N$ , as soon as the lifting device  $Q$  is returned to normal position.

By constructing the spring devices  $L$ ,  $L'$  in the manner described, they are not liable to be unduly strained, and they tend to hold the coupling pipes  $F$  in horizontal position at the time the cars are uncoupled, and the spring devices readily yield, to allow proper coupling of the heads  $G$  even should the same stand at different heights, as the pipes  $F$  can swing up or down to compensate for any discrepancy.

The construction of the coupling heads  $G$  insures a positive coupling of the same, without danger of leakage of the fluid pressure, as the contacting faces are interlocked, that is, the shoe of one head engages the socket of the other head. It will also be seen that all jars, jolts and stresses are readily taken up by the spring devices  $L$ ,  $L'$ , thus relieving the coupling heads  $G$  of undue strains.

By the co-action of the spring devices  $L$ ,  $L'$  the bar  $F'$  and pin  $F^2$ , the coupling pipe  $F$  and its coupling head  $G$  are held at an angle of approach (see Fig. 6), so that the forward end of the shoe  $G'$  of one head  $G$  strikes the other head at about the middle when the heads come together, and when the cars are uncoupled the shoes readily disengage their interlocking sockets, owing to the sidewise pressure exerted on the pipe  $F$  by the action of the spring devices  $L$ ,  $L'$  operating in conjunction with the bar  $F'$  and the pin  $F^2$ .

The pockets  $G^2$  of the coupling heads  $G$  are preferably provided with holes  $G^5$  (see Fig. 7), for the escape of snow or other extraneous matter that may pass into the pockets  $G^2$ .

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A train pipe coupling, comprising a coupling pipe provided with a head and a valve, the coupling pipe being supported from the draw bar of the car and being mounted to swing laterally and to slide in the direction of its length, and means for controlling the position of the said valve by the movement of the said pipe and its head, the said means including a rod mounted to slide and connected with the valve, the said rod being provided at its forward end with a coupling member.

2. A train pipe coupling, comprising a coupling pipe supported from the draw bar of the car and moving with the draw bar, a coupling head on the forward end of the said coupling pipe, a valve on the rear of the said pipe and connected with a pressure supply, and means arranged for manual control and controlled by the movement of the said coupling pipe and coupling head and connected with the said valve to control the opening and closing movement thereof,

the said means comprising a valve-operating rod mounted to slide at its rear end and having a coupling member at its forward end.

3. A train pipe coupling, comprising a  
5 coupling pipe supported from the draw bar of the car and moving with the draw bar, springs connected with the said coupling pipe to normally hold the same in a forward  
10 coupling position, a coupling head on the forward end of the said coupling pipe, a valve on the rear of the said pipe and connected with a pressure supply, and means arranged for manual control and controlled  
15 by the movement of the said coupling pipe and coupling head and connected with the said valve to control the opening and closing movement thereof, the said means comprising  
20 a valve-operating rod mounted to slide at its rear end in a bearing on the valve and adapted to be raised and lowered, the said rod having a coupling member at its forward end extending into an opening in the said coupling head.

4. A train pipe coupling, comprising a  
25 coupling pipe supported from the draw bar of the car and moving with the draw bar, a coupling head on the forward end of the said coupling pipe and disposed in a vertical plane oblique to the said coupling pipe,  
30 a valve on the rear of the said pipe and connected with a pressure supply, and means arranged for manual control and controlled by the movement of the said coupling pipe and coupling head and connected with the  
35 said valve to control the opening and closing movement thereof.

5. A train pipe coupling, comprising a coupling pipe supported from the draw bar of the car and moving with the draw bar, a  
40 coupling head on the forward end of the said coupling pipe and disposed in a vertical plane oblique to the said coupling pipe, the coupling head being of an approximately diamond shape and provided at its  
45 face near the rear end with a pocket for the reception of the forward end of an opposing coupling head, a valve on the rear of the said pipe and connected with pressure supply, and means arranged for manual control and controlled by the movement of the  
50 said coupling pipe and coupling head, and connected with the said valve to control the opening and closing movement thereof.

6. A train pipe coupling, comprising a  
55 coupling pipe supported from the draw bar of the car and moving with the draw bar. a coupling head on the forward end of the said coupling pipe and disposed in a vertical plane oblique to the said coupling pipe,  
60 the coupling head being of an approximately diamond shape and provided at its face at the rear end with a pocket and provided at the top and bottom of the rear half of its face with guides, a valve on the rear of the  
65 said pipe and connected with a pressure sup-

ply, and means arranged for manual control and controlled by the movement of the said coupling pipe and coupling head and connected with the said valve to control the opening and closing movement thereof. 70

7. A train pipe coupling, comprising a support depending from the draw bar of the car, a bearing mounted on the said support to swing up and down and sidewise, a coupling pipe mounted to slide in the said bearing,  
75 a coupling head on the forward end of the said coupling pipe, a valve on the rear of the said pipe and arranged for connection with a fluid pressure supply, springs pressing the said pipe in a forward direction, and  
80 means arranged for manual control and for control by the movement of the said coupling pipe and its head, the said means being connected with the said valve to control the opening and closing movement thereof. 85

8. A train pipe coupling, comprising a support depending from the draw bar of the car, a bearing mounted on the said support to swing up and down and sidewise, a coupling pipe mounted to slide in the said bearing,  
90 a coupling head on the forward end of the said coupling pipe, a valve on the rear of the said pipe and arranged for connection with a fluid pressure supply, springs connecting the rear end of the coupling pipe  
95 with the said support for normally holding the said coupling pipe and its head in a forward position, a slotted bar on the coupling pipe and head, a pin on the said support engaging the said slotted bar, and means  
100 arranged for manual control and controlled by the movement of the coupling head and pipe for controlling the opening and closing movement of the said valve.

9. A train pipe coupling, comprising a  
105 support depending from the draw bar of the car, a bearing mounted on the said support to swing up and down and sidewise, a coupling pipe mounted to slide in the said bearing, a coupling head on the forward end of  
110 the said coupling pipe, a valve on the rear of the said pipe and arranged for connection with a fluid pressure supply, a spring device connecting the rear end of the coupling pipe with the said support, a rod  
115 mounted to slide lengthwise and adapted to be raised and lowered, the rod having a coupling member extending into an opening in the said coupling head, stops on the said rod for engagement with the said support to  
120 limit the sliding movement of the rod, a spring-pressed trip pin engaging the said rod and mounted to slide in the said support, a spring-pressed locking pin slidable  
125 in the said support and adapted to engage the said trip pin to hold the latter and the rod in a raised position, the said locking pin being controlled by the said spring device, and a connection between the said rod and the said valve. 130

10. A train pipe coupling, comprising a support depending from the draw bar of the car, a bearing mounted on the said support to swing up and down and sidewise, a coupling pipe mounted to slide in the said bearing, a coupling head on the forward end of the said coupling pipe, a valve on the rear of the said pipe and arranged for connection with a fluid pressure supply, a spring device connecting the rear end of the coupling pipe with the said support, a rod mounted to slide lengthwise and adapted to be raised and lowered, the rod having a coupling member in the form of a fork extending into an opening in the said coupling head, stops on the said rod for engagement with the said support to limit the sliding movement of the rod, a spring-pressed trip pin engaging the said rod and mounted to slide in the said support, a spring-pressed locking pin slidable in the said support and adapted to engage the said trip pin to hold the latter and the rod in a raised position, the said locking pin being controlled by the said spring device, and a connection between the said rod and the said valve.

11. A train pipe coupling, comprising a support depending from the draw bar of the car, a bearing mounted on the said support to swing up and down and sidewise, a coupling pipe mounted to slide in the said bearing, a coupling head on the forward end of the said coupling pipe, a valve on the rear of the said pipe and arranged for connection with a fluid pressure supply, springs pressing the said pipe in a forward direction, a rod arranged for manual control and for control by the movement of the said coupling pipe and its head, the said rod being connected with the said valve to control the opening and closing movement thereof, and a manually-controlled device connected with the said rod for raising the same on coupling adjacent cars.

12. A train pipe coupling having a coupling pipe arranged for connection at its rear end with a fluid pressure supply, a coupling head secured on the forward end of the coupling pipe and approximately diamond shape, the coupling head having its face ar-

ranged in a vertical plane oblique to the length of the coupling pipe, the rear end of the said face being provided with a pocket and the top and bottom of the rear half of the face being provided with guides, the front half of the head forming a shoe, and a guideway formed on the back of the coupling head and opening at the face thereof.

13. A train pipe coupling, comprising a support depending from the draw bar of a car, a bearing mounted on said support to swing up and down and sidewise, a coupling pipe mounted to slide in the said bearing, a coupling head on the forward end of the coupling pipe, a valve on the rear end of the coupling pipe and arranged for connection with a fluid pressure supply, a spring device connecting the rear end of the coupling pipe with the said support, a rod mounted to slide lengthwise and adapted to be raised and lowered, the rod having a coupling member, means for limiting the sliding movement of the rod, means for holding the rod in a raised position, the said means being controlled by the said spring device, and a connection between the said rod and the valve.

14. A train pipe coupling, comprising a support depending from the draw bar of a car, a coupling pipe provided with a head at its forward end and a valve at its rear end, the coupling pipe being mounted in said support to swing laterally and to slide in the direction of its length, lugs projecting from the top and bottom of said valve, spring devices connected at their rear ends to said lugs and at their forward ends to said support, the said spring devices pressing the said coupling pipe in a forward direction, and means for controlling the position of the said valve by the movement of the said coupling pipe and its head.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HARVEY OLIVER WITWER.

Witnesses:

H. B. GOOD,  
SAMUEL C. WITWER.