To all whom it may concern:

Be it known that I, Raymond L. Johnson, of Nekoma, Kansas, have invented a new and useful Air-Pipe Coupling for Railway-Cars; and I do hereby 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.

The present invention relates to an air pipe coupling for railway cars, and has for its object to provide a device of this character which embodies novel features of construction whereby the train pipes can be effectively coupled when two cars are brought together.

Further objects of the invention are to provide an air pipe coupling which is comparatively simple and inexpensive in its construction, which utilizes the force of magnetism to obtain a tight joint between the coupling heads, and which can be manipulated without danger to the operator.

With these and other objects in view, the invention consists in certain novel combinations and arrangements of the parts as will more fully appear as the description proceeds, the novel features thereof being pointed out in the appended claims.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawings, in which—

Figure 1 is a side elevation of the adjacent ends of a pair of railway cars having the train pipes thereof connected by a coupling device embodying the invention.

Fig. 2 is an enlarged longitudinal sectional view through the coupling device.  Fig. 3 is a similar view, showing a slight modification.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Referring to the drawings, the reference characters designate railway cars which are of the conventional construction, said cars being provided with the usual air tanks 1 and train pipes 2.  The train pipe 2 at one end of each car is provided with a coupling member 3 which has a forwardly facing frusto-conical valve seat 4 and a flared mouth 5 leading to the valve seat.  The train pipe at the opposite end of each car is connected by a length of flexible hose 6 to a complementary coupling member 7 which is formed of soft iron and is highly magnetized, the end 7° of the coupling member having a conical formation and being adapted to enter the flared mouth 5 of the opposite coupling member 3 and engage the frusto-conical valve seat 4 thereof.  The coupling member 3 is also formed of iron so that when the two coupling members are brought into engagement with each other the magnetism of the coupling member 7 will cause the member 3 to adhere tightly to the conical end 7° of the member 7, the valve seat 4 and end 7° being accurately ground to produce an air-tight joint when the two members are brought together.  The frusto conical seat 4 is preferably provided with an annular groove within which a packing strip 14 is fitted, said packing engaging the conical end 7° of the member 7 to insure a perfectly air-tight joint when the two coupling members are brought together.

The flexible hose 6 is secured to the end of the train pipe 2 and coupling member 7 by suitable clamps 8, and is surrounded by a stiff spiral spring 9 which normally holds the coupling member 7 in proper position for entering the flared mouth of the coupling member 3 when the two cars A are brought together, although it will readily yield in the necessary manner to accommodate the relative movements of the cars after the members have been coupled.  The air passage 10 through the coupling member 7 terminates adjacent the pointed end of the coupling in branches 10° which open through the sides of the conical end at points adjacent the pointed extremity thereof.  This pointed extremity of the coupling member cooperates with the flared mouth 5 and frusto-conical valve seat 4 to direct the member 7 into a proper engagement with the member 3 when the cars A are brought together, and also serves to engage and automatically open a check valve 11 in the coupling member 3 when the two coupling members are properly connected.  This check valve 11 opens inwardly and engages a rearwardly facing valve seat 12 in the coupling member 3.  A spring 13 normally serves to hold the check valve in a closed position, and the valve is directed in its movements.
by a stem 14 which projects rearwardly therefrom and slides through a guide sleeve 15 carried by a spider 16. The coupling member 7 is provided with a similar check valve 24 which is normally held in engagement with a valve seat 25 by means of the coil spring 26. This valve 24 is carried by a stem 27, the rear end of the stem being slidably engaged by a guide sleeve 28 carried by a spider 29, while the forward end of the stem slides through an opening in the pointed end 7a of the member 7 and projects beyond the said member when the valve is closed. When the two coupling members are brought together the projecting end of the stem 27 is engaged by the valve 11 of the coupling member 3, said valve 11 being opened by the pointed end of the coupling member 7, while the valve 24 is opened by pressure exerted upon the stem 27 by the valve 11. The two check valves are thus automatically opened to establish communication between the train pipes 2 of the two cars when the coupling members are brought together into an operative relation. When the train pipes are uncoupled the spring 13 closes the valve 11 and the spring 26 closes the valve 24, thereby preventing the escape of air from the air tank or reservoir on the car. When the cars are coupled the magnetism will ordinarily be sufficient to hold the coupling members 3 and 7 together, since the frusto conical valve seat 4 has a comparatively large surface area which engages directly with the conical end 7a of the coupling member 7.

A slight modification is shown by Fig. 3 in which the coupling member 7, instead of being permanently magnetized, is in the form of an electro-magnet, being surrounded by a coil 20. The flow of current through the coil may be controlled by any suitable switch 21, and it will be understood that as long as the coupling member is energized the valve seat 4 of the member 3 will be held in a firm engagement with the conical end of the member 7a by the force of magnetism. When it is desired to disconnect the coupling members the switch 21 is manipulated to deenergize the electro-magnet, whereupon the coupling member 3 can be easily separated from the coupling member 7.

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

1. A train pipe coupling including a tubular coupling head provided with an inwardly opening check valve, and having an outwardly facing hollow frusto-conical seat at the end thereof, and a complemental coupling head formed with a conical end for engagement with the hollow seat, the pointed extremity of the conical end being adapted to engage and unseat the check valve, the engaging surfaces of the conical head and hollow seat being of exposed iron and one of the coupling heads being magnetized so that the conical end will be locked in a firm engagement with the hollow seat.

2. A train pipe coupling including a tubular coupling head provided with an inwardly opening check valve and having an outwardly facing hollow frusto-conical seat at the end thereof, a complemental tubular coupling head terminating in a conical end for engagement with the hollow frusto-conical seat, the pointed apex of the conical head being adapted to engage and unseat the check valve, a second inwardly opening check valve in the complemental coupling head, and a stem carrying the second check valve and projecting through the apex of the pointed end of the coupling head for engagement with the first mentioned check valve to open the second mentioned check valve when the coupling heads are brought together, the engaging surfaces of the conical end and hollow seat being of exposed iron and one of the coupling heads being magnetized so that the conical end will be held firmly in engagement with the hollow frusto-conical seat.

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

RAYMOND L. JOHNSON.

Witnesses:

EMIL JOHNSON,

MRS. OLLIE FARMER.