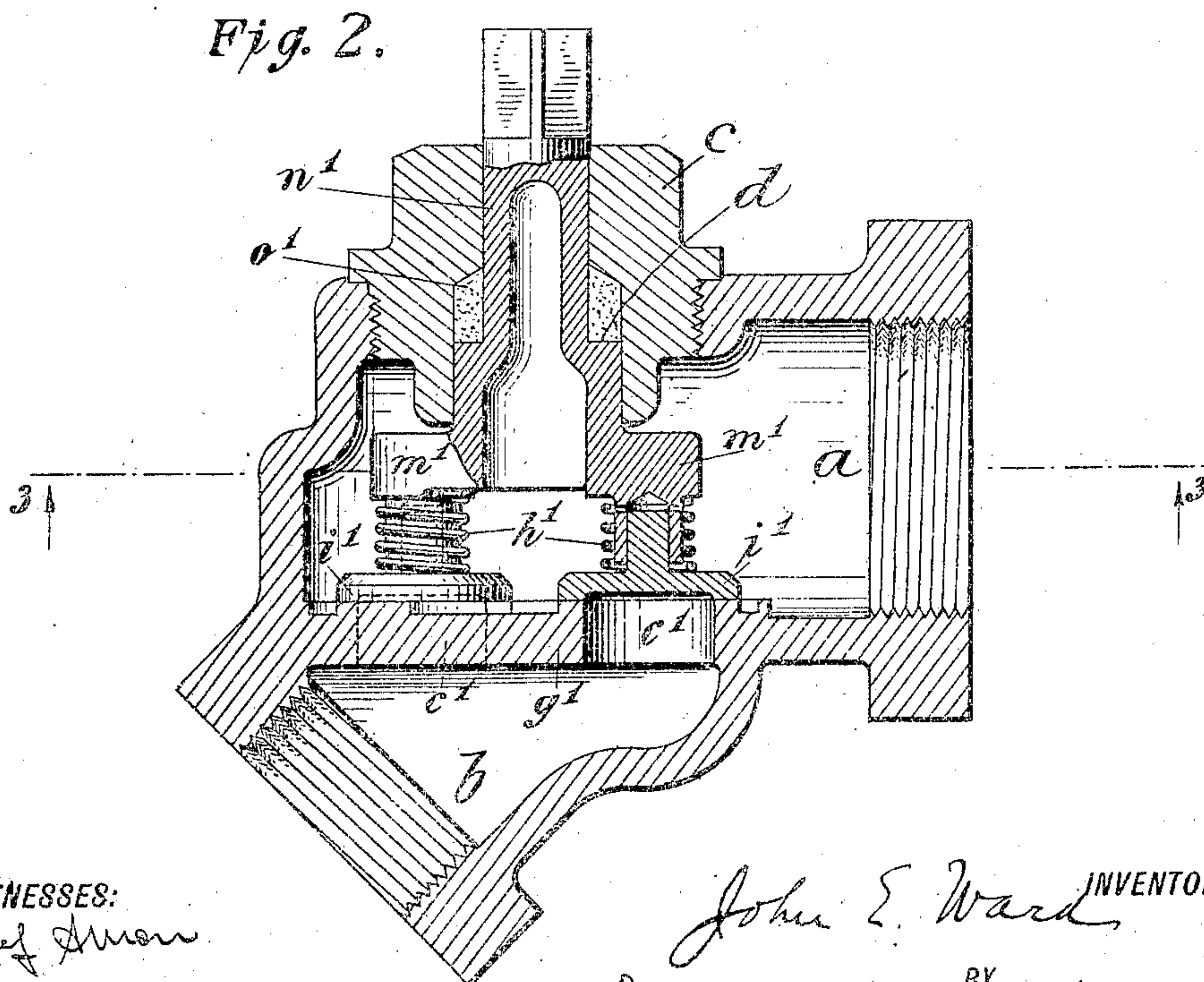
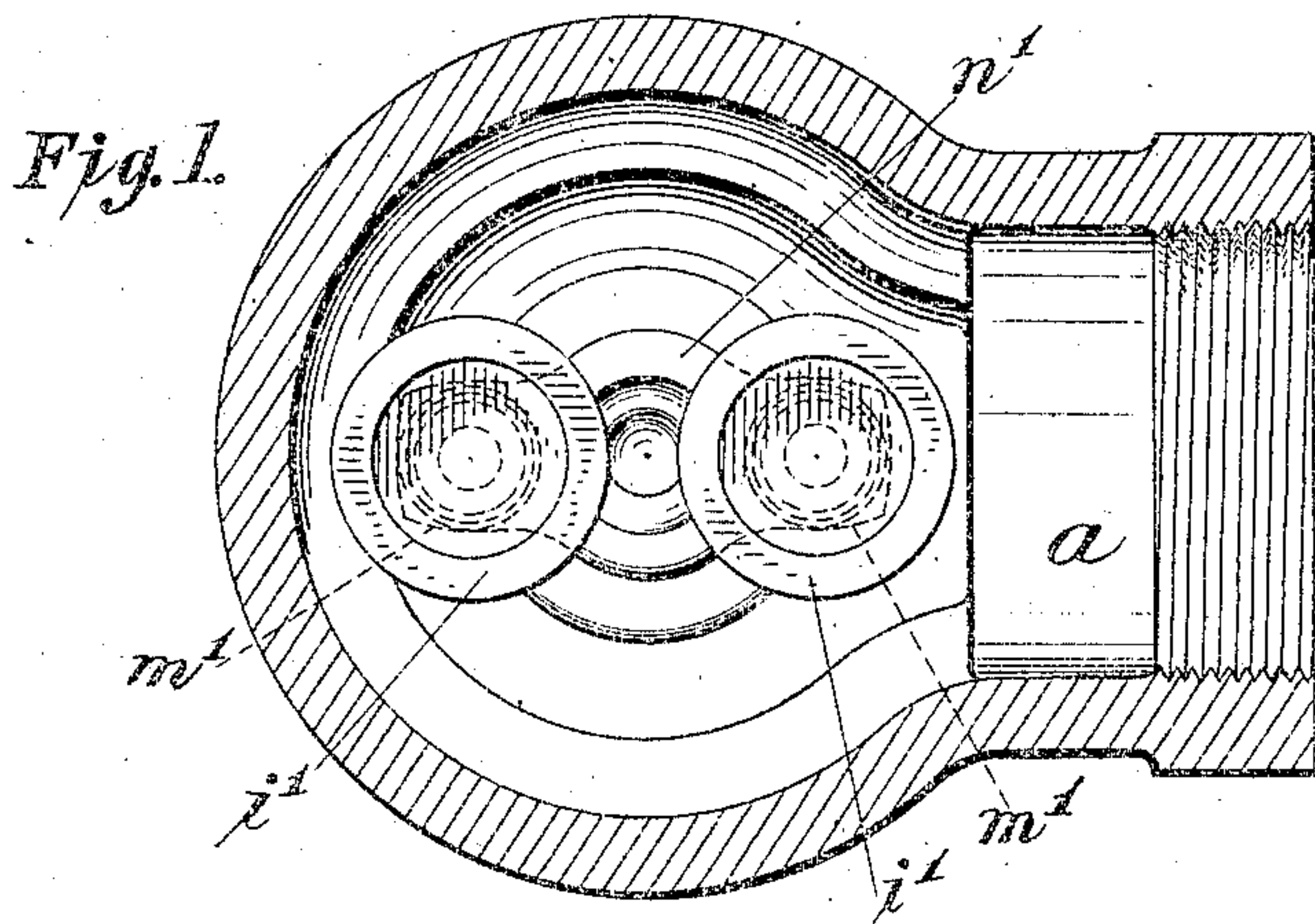


VALVE.

924,861.

Patented June 15, 1909.



**WITNESSES:**

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# UNITED STATES PATENT OFFICE.

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## VALVE.

No. 924,861.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed May 12, 1908. Serial No. 433,403.

*To all whom it may concern:*

Be it known that I, JOHN E. WARD, a citizen of the United States, and a resident of the borough of Manhattan, of the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Valves, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

The invention relates more particularly to what are known as end train pipe valves which are employed in the steam heating apparatus of railway cars, although the same may be applied in various other connections as will appear hereinafter. In such apparatuses, it is desirable to provide a valve which shall not permit the water of condensation to collect therein or in the pipe adjacent thereto but through which, on the other hand, any such water may readily and automatically discharge into the coupling hose connected thereto, thus preventing the water from cooling and freezing in the train pipe or the valves at either end thereof. It is also desirable that the steam may be turned on and off by a quarter turn or less of the handle through which the valve is manipulated, for the reason that any considerable movement of this handle is apt to be impeded by adjacent parts and for the further reason that a quarter turn or thereabout is easy to effect and offers at the same time a good indication of the position of the valve, whether open or closed.

The object of the invention is accordingly to provide a simple and comparatively inexpensive valve structure or fitting which shall have the characteristics above referred to and which shall be capable of being contained in a very small compass.

The invention will be explained more fully hereinafter in connection with the accompanying drawings in which—

Figure 1 is a view partly in horizontal section and partly in plan of a valve embodying the invention, the plane of the section being indicated by the dot and dash line in Fig. 2, which is a view of the same partly in vertical section and partly in elevation.

The valve is shown in Fig. 2 of the drawings in the position which it occupies when screwed in place upon the train pipe, one such valve being provided at each end of a car and forming the connection between the

train pipe and the coupling hose by means of which the pipes upon adjacent cars are made to communicate. In such position, it will be seen that the partition  $g'$  of the valve, which separates the port  $a$  from the port  $b$ , is in line with the bottom of the port  $a$  or, what is the same thing, with the bottom of the train pipe which joins the port  $a$ . Such partition, moreover, overlies the port  $b$  to which the coupling hose is attached. This latter port, as will be seen, forms an obtuse angle, so far as its direction is concerned, with the other port. In the partition  $g'$  are formed one or more passages  $c'$ , preferably a plurality of passages, and such passages are controlled by a corresponding number of valve plugs  $v'$ . In this particular instance, there are two passages  $c'$  arranged on opposite sides of the center of the partition  $g'$  and the valve plug corresponding with each passage is held against its valve seat in the partition  $g'$  by means of a spring  $h'$  which is coiled about a projection upon the valve plug which extends upwardly into an arm  $m'$  formed upon the valve spindle  $n'$ , the valve plug thus being free to rotate and move in a vertical direction, but being held down upon its seat through the action of its spring.

The axis of the spindle is vertical and normal to the plane of the partition  $g'$  and the arms  $m'$  upon the spindle, extending as they do from the center outward, bring the valve plug into a position to one side of the center line or axis of the spindle; and it will be obvious that the greater the number of the openings  $c'$  (and therefore of the valve plugs) which are provided, the shorter the arms  $m'$  may be made without decreasing the area of valve passage. Moreover, by increasing the number of such passages the angularity of the movement of the spindle in order to open and close the valve may be decreased. It follows therefore that by providing a plurality of passages through the valve, the fitting embodying the same may be made very compact indeed.

The spindle  $n'$  extends upward through a suitable opening or recess in the screw cap  $c$  and is provided with an enlargement or hub which fits an enlargement or the recess in the screw cap, which enlarged recess is of sufficient length to constitute a packing chamber or box above the hub, in which a packing  $o'$  is confined between the upper end of the recess, which is preferably conical as



shown, and the shoulder *d* at the top of the hub.

It will be seen from Fig. 2 that the springs *h'* will operate upon the spindle so as to keep the shoulder *d* jammed tightly against the packing, such a construction obviously doing away with the necessity of providing a gland. It will be obvious too that besides the action of the springs, that of the steam pressure will serve also to keep the spindle jammed tightly against the packing.

It will be understood that the spindle is provided with a handle or lever (not shown in the present drawings) for conveniently turning the same. With such a handle it will be easy to understand from an examination of the drawings how, by a quarter turn or less, the valve may be opened or closed.

It ought to be mentioned that the pipes upon the railway cars to which the improved valve is intended to be connected, are generally inclined from the center to the ends of the cars. In this way, the water of condensation will always run down toward the valve where it should be permitted to discharge into the coupling hose in order that it may not remain in the pipes and freeze or cause other injury thereto.

It will be seen that by reason of the particular construction of the applicant's device the water passing in by port *a* will have a free passage when the valve is open through the port *b*, which is on a level with the bottom of the inlet port *a*, and there being no partition or other check in the fitting above the valve seat. In other words the partition *g'* is substantially continuous with the bottom of the pipe and when the valve is open, as is generally the case when the cars are coupled together, such partition will not hinder the water which flows into the valve from the train pipe from passing down into the port *b* and into the coupling hose. When the hose is uncoupled, the pressure of the steam in the train pipes will cause the condensed water in the system to blow off through the blow-off port *b* of the valve and through the hose.

Devices of the character herein set forth

are subjected to extremely rough usage and any tilting of the valve spindle and valve resulting from such usage causes an objectionable leakage. It will be seen that in the construction shown provision is made to prevent such tilting by extending the bearing upward above and downward into and below the normal outline of the casing so that the valve spindle has practically a bearing equal to its length, and by forming the packing box in said bearing and closing it by the hub of the spindle the packing is securely confined and maintained tight around the spindle by the action of the springs *h'* as well as by the pressure of the steam tending to force the spindle upward, while the valve plugs are maintained upon their seats even if the spindle rises as the packing becomes compressed or wears. It will be seen further that by forming the packing box in the detachable cap the latter can be readily removed or elevated upon the spindle to permit the packing to be removed and replaced.

I claim as my invention:

In a device of the class described, the combination with a casing having inlet and outlet branches, of a horizontal valve seat therein having its upper face level with the bottom of the inlet branch, a rotary valve spindle terminating above said valve seat and having its upper end made in two diameters forming an upwardly facing shoulder, a nut constituting a bearing for said spindle having a bore of two diameters forming an interior downwardly facing shoulder, packing between the said shoulders on the spindle and nut, the said nut being extended both exteriorly and interiorly beyond the casing to form a long bearing for the spindle, a valve plug connected to the lower end of said spindle so as to turn therewith, and a spring interposed between said spindle and plug so as to keep the plug upon the valve seat.

This specification signed and witnessed this 14th day of May, A. D. 1908.

JOHN E. WARD.

Signed in the presence of—

LUCIUS E. VARNEY,  
HOMER H. SNOW.