

C. L. ARMSTRONG.
DRAIN VALVE.
APPLICATION FILED JUNE 10, 1910.

984,994.

Patented Feb. 21, 1911.

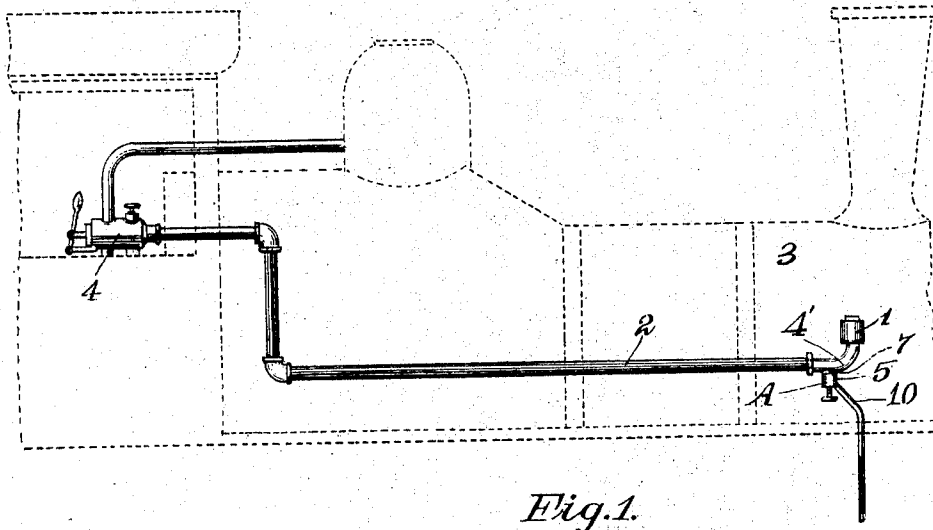


Fig. 1.

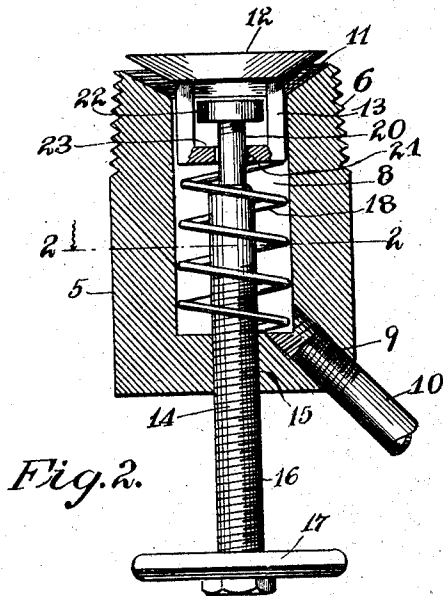


Fig. 2.

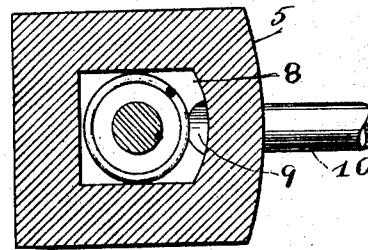


Fig. 3.

Witnesses
Thos. F. Knox,
C. Bradley,

Inventor
Cloyd L. Armstrong
By Victor J. Evans
Attorney

UNITED STATES PATENT OFFICE.

CLOYD L. ARMSTRONG, OF LIMA, OHIO.

DRAIN-VALVE.

984,994.

Specification of Letters Patent.

Patented Feb. 21, 1911.

Application filed June 10, 1910. Serial No. 566,225.

To all whom it may concern:

Be it known that I, CLOYD L. ARMSTRONG, a citizen of the United States, residing at Lima, in the county of Allen and State of Ohio, have invented new and useful Improvements in Drain-Valves, of which the following is a specification.

This invention relates to a drain valve for the water feed pipe of a locomotive, which permits the pipe to automatically drain after the pump or injector ceases operating, so that freezing of the pipe in cold weather will be prevented.

The invention has for one of its objects to improve and simplify the construction and operation of devices of this character so as to be comparatively simple and inexpensive to manufacture, reliable and efficient in use, and so designed as to be entirely automatic.

Another object of the invention is the provision of a valve which is normally held open by a spring so that the water supply pipe between the injector and check valve of a locomotive will be open to the atmosphere, and when the injector starts, the valve will automatically close so that water will pass to the boiler, there being means for holding the valve seated when it is to be cut out of use, as in warm weather.

With these objects in view and others, as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawing, which illustrates one embodiment of the invention, Figure 1 is a side view of a locomotive showing the drainage valve applied to the water feed pipe. Fig. 2 is an enlarged detail section of the valve.

Similar reference characters are employed to designate corresponding parts throughout the views.

Referring to the drawing, 1 designates the usual check valve through which the water passes from the feed pipe 2 to the boiler 3, the water being supplied by an injector 4 or an equivalent device. At the base of the elbow 4' of the check valve 1, the drainage device A is applied. This drainage device comprises a plug or valve casing 5 which has its upper end formed with tapering screw threads 6 which engage in an opening 7 in the bottom of the elbow 4'. This plug

5 has a chamber 8 through which the water drains from the elbow 4' and pipe 2, there being an outlet opening 9 in the bottom of the chamber 8, and, if desired, a drainage pipe 10 can be screwed into this opening to carry the water down under the locomotive. On the upper end of the plug 5 is a conical valve seat 11 with which engages a mushroom or puppet valve 12 that has a body portion 13 extending into the chamber 8. This body 13 is connected, by a combined swivel and slip joint, to the inner end of a stem 14 which extends into the plug through an opening 15 in the bottom of the plug, the said opening being tapped so as to be engaged by the thread 16 on the stem. The outer end of the stem has a hand wheel 17 so that, by turning the wheel, the stem can be moved longitudinally.

Interposed between the bottom of the chamber 8 and bottom of the valve 12, is a helical spring 18 which serves to hold the valve yieldingly open, and this spring is of such tension that the valve can automatically close as soon as the injector starts to operate. The inner end of the stem has a reduced portion 20 that passes through an opening 21 in the body of the valve, and on the extremity of this reduced portion is a head 22 that engages a shoulder 23 at the bottom of the valve body. By means of this connection between the valve and stem, the valve can freely open and close independently of the stem and yet the stem can be turned when it is desired to positively close the valve.

When the water feed device is not in operation, the valve 12 will be held open by the spring 18. As soon as the injector starts to operate, the pressure of the fluid in the feed pipe 2 will cause the valve to close against the tension of the spring 18 and thereby prevent water from leaking out of the drainage device. When the steam supply is cut off from the injector, the flow of water to the boiler will cease and, as a consequence, pressure acting on the valve 12 will be reduced to a point less than the pressure exerted by the spring 18. Consequently, the valve 12 will open and permit the water to drain out of the pipe 2. In warm weather, there is no necessity for draining the pipe 2 and at this time the valve 12 will be closed. To close the valve, the hand wheel 17 is turned in a direction to move the stem 14 outwardly until the head 22 engages the

valve and draws the latter firmly against its seat.

From the foregoing description, taken in connection with the accompanying drawing, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

Having thus described the invention, what I claim is:—

1. A drain device comprising a casing including a valve seat, a valve adapted to engage the seat, a spring in the casing on which the valve rests and by which it is held off the seat, a threaded stem extended into the casing and passing through the spring, means for turning the stem, a lost-motion connection between the inner end of the stem and the valve for permitting the valve to open and close independently of the stem, and for permitting the valve to be

closed by the turning of the stem, said valve being held in coöperative relation with the seat by means of the lost-motion connection between the stem and valve, and means for draining from the casing liquid that enters the same when the valve is open.

2. A drainage device for liquid supply conduits comprising a casing having an external thread at its upper end and also provided with a valve seat at its upper end, said casing having a drainage opening and also a tapped opening in its bottom, a puppet valve arranged to normally project out of the casing and adapted to engage the said seat, there being a portion of the valve extending into the casing, a threaded valve stem engaged in the tapped opening and extending into the valve, a swivel and lost motion connection between the valve and stem, and a spring interposed between the bottom of the valve and bottom of the casing to yieldingly hold the valve open, said spring being spirally wound around the stem.

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

CLOYD L. ARMSTRONG.

Witnesses:

O. H. ODELL,
JAMES P. O'NEILL.