C. W. NEWCOMBE.

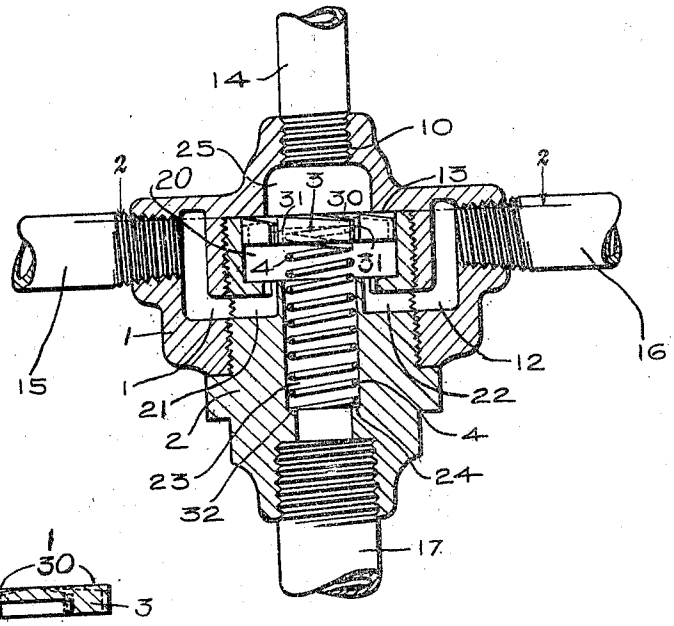
AUTOMATIC DRAIN VALVE.

APPLICATION FILED JULY 10, 1916.

Patented May 22, 1917.

1,226,796.

Fig. 1



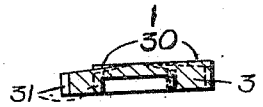
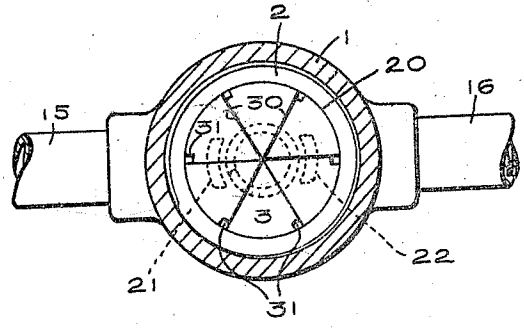


Fig. 3.

Fig. 2



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UNITED STATES PATENT OFFICE.

CHARLES W. NEWCOMBE, OF TACOMA, WASHINGTON.

AUTOMATIC DRAIN-VALVE.

1,226,796. Specification of Letters Patent. Patented May 22, 1917.

Application filed July 10, 1916. Serial No. 108,523.

To all whom it may concern:

Be it known that I, CHARLES W. NEWCOMBE, citizen of the United States, and resident of Tacoma, Pierce county, State of Washington, have invented certain new and useful Improvements in Automatic Drain-Valves, of which the following is a specification.

My invention relates to drain valves designed for application to steam engine cylinders and other containers, which at times contain steam and which it is desired to have drained of water when the pressure is removed.

The object of my invention is to provide a device of simple construction, which shall be automatic in its action, which is reliable and prompt in action and which will thoroughly drain, not only the chambers with which it is connected, but itself, so that no water of any amount can remain therein for freezing.

My invention comprises the novel features of construction which will be herein described and then particularly pointed out in the claims.

In the accompanying drawings I have shown my invention in the type of construction which is now preferred by me.

Figure 1 is a central longitudinal section.

Fig. 2 is a cross section taken on the line 2—2 of Fig. 1.

Fig. 3 is a section lengthwise the piston.

The outer or casing member 1, of my device, is bored from one end to form a chamber for the reception of the inner end of plug member 2. These two members are secured by threading the plug within the casing. The inner end of the plug preferably seats on a shoulder 13 formed at the inner end of the casing.

Casing 1 is provided with a high pressure inlet 10, to which the high pressure pipe 14 is connected. It is also provided with two low pressure ports 11 and 12, with which pipes 15 and 16 are connected. These latter ports are at the sides of the casing, while the high pressure connection is at the end thereof. While I have shown and will describe, only two low pressure connections with the casing, it is evident that more may be provided, if desired.

The inner end of the plug 2 is bored to form a piston-valve-receiving chamber 20, in which the piston valve 3 fits to form a snug, but freely sliding fit. The plug is provided with low pressure inlet ports 21 and 22, which, when the plug is seated in place, register with the low pressure inlet ports 11 and 12, of the casing. Their inner ends open within the bottom face of the piston-valve-receiving chamber 20 and inward a short distance from the periphery thereof.

The piston valve 3 is recessed to receive the closing spring 4 and the discharge or drainage outlet 23 is large enough to receive the same spring, and has a ledge 24 against which the spring bears.

The piston valve 3 is provided with grooves 31 extending across its periphery and connecting opposite sides thereof. It is also provided with ports connecting these grooves 31 with the chamber 25 at the upper end of the casing. These ports, as herein shown, consist of recesses 30 which connect with the grooves 31 and extend inward toward the center. These, as shown, are somewhat of the character of the teeth formed upon an end-faced mill or cutter. They may, however, be of any convenient type of construction. Steam or water when passing through the valve will impinge upon the axial faces thus produced to give the piston valve a slight turning movement.

With high pressure steam acting upon the upper surface of the piston valve 3, it will be forced down and seated upon the bottom of the chamber 20, thereby closing the ports 21 and 22, as the ports 21 and 22 are located sufficiently inward from the outer margin of this head as to not be in communication with the grooves 31, when the piston valve is seated.

If, during this condition, an excess pressure should be suddenly developed in either of the chambers with which pipes 15 and 16 are connected, this excess pressure, communicated through these pipes to the ports 21 or 22, as the case may be, would lift the piston valve and permit discharge of this excess pressure through the discharge channel 23 and the pipe 17 connected therewith. As soon as this excess pressure is released the high pressure, acting through pipe 14, will immediately seat the valve.

When the high-pressure communicated through pipe 14 is cut off or released, the spring 4 will act to raise the piston valve. The low pressure pipes 15 and 16 are thus placed in communication with the discharge pipe 17, as is also the high pressure pipe 14 through the recesses 30 and grooves 31.

What I claim as my invention is:

1. In a drain valve, in combination, an outer casing member having a high pressure port in its head and low pressure port in its sides, a plug or closing inner member having a piston chamber recessed into its inner end and a discharge port extending from said piston chamber to the outer end of the plug, and also having low pressure ports extending from the bottom face of said piston chamber to connections with the low pressure ports of the casing, a piston in said chamber having by-pass ports extending across its periphery from face to face and extending thence toward the center of its face which is toward the high pressure port, and a spring acting to force the piston toward the high pressure port.

2. In a drain valve, in combination, an outer casing cylindrically bored from one end, and having a high pressure port in its head and low pressure ports at its sides, an inner member fitting the bore in the casing and having its inner end bored to form a piston-receiving chamber and having a discharge port extending from the bottom of said chamber to its outer end and low pressure ports extending from the bottom of said chamber and communicating with the low pressure ports in the casing, a piston valve fitting said chamber and having by-pass channels in its periphery extending from face to face and communicating channels in high pressure face extending toward the center, and a spring seated in the discharge port and acting to hold the piston away from the bottom of the chamber.

Signed at Seattle, Washington, this 30th day of June, 1916.

CHARLES W. NEWCOMBE.