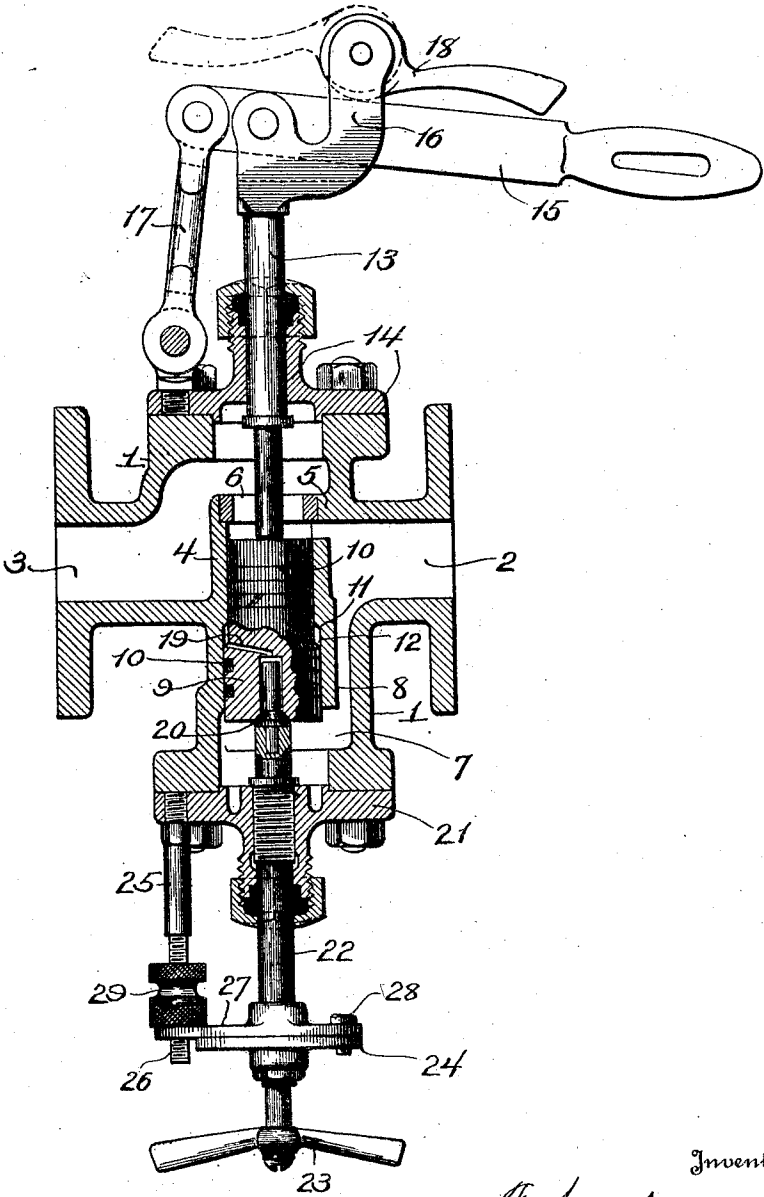


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VALVE.

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FREDERICK HEATH, OF SOUTH BELLINGHAM, WASHINGTON.

VALVE.

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To all whom it may concern:

Be it known that I, FREDERICK HEATH, a citizen of the United States, and resident of South Bellingham, in the county of Whatcom and State of Washington, have invented certain new and useful Improvements in Valves; 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.

My present invention relates to valves which automatically close to cut off the flow of fluid when an abnormal condition arises in the system in which the valve is installed, and is designed particularly to control the flow of oil to burners. The invention has for its object the production of a novel valve which will close automatically upon a reduction of the pressure at the delivery side of the valve and will remain closed until manually opened after working conditions are restored. Other objects of the invention are to provide means for locking the valve in open position, means for venting the valve, novel means for adjusting the valve, and means for locking the adjusting means in a set position. All these objects are attained in such a device as is illustrated in the accompanying drawing and herein-after described and claimed.

The drawing is a sectional view partly in elevation of a device embodying my present improvements.

The valve comprises a body or casing 1 having an inlet port 2 in one side which, in practice, is connected with a pump whereby the oil is delivered under pressure, and having an outlet port 3 in its opposite side which is connected with the pipe leading to the burners. A web or partition 4 is provided within the body or casing and rises from the lower wall of the outlet port at the inner end thereof to meet a web 5 extending from the inner end of the inlet port at the top thereof. A port 6 is formed in the web 5 and a tortuous passage for the oil is thus provided through the casing. The valve body 1 is so formed as to provide a pressure chamber 7 below and at the inner end of the inlet port, and a barrel or valve guide and support 8 is formed within this chamber in axial alinement with the port 6 and in spaced relation to that wall of the casing which depends from the inner end of the inlet port. A piston valve 9 is slidably mount-

ed in the barrel 8, the ends of the barrel being open and spaced from the port 6 and the bottom of the chamber 7 respectively so that both ends of the valve are exposed to the pressure of the oil in the casing. The piston is fitted with piston rings 10 to resist leakage and the lower end of the piston is somewhat larger than its upper end so that, owing to its greater area, the pressure thereon will overbalance the pressure on its upper end and, consequently, there will be a constant tendency of the piston valve to seat and close the port 6. The barrel 8 is, of course, of a differential form corresponding to the form of the piston, a shoulder 11 on the barrel being opposed to a shoulder 12 on the piston and preventing the piston jamming against its seat at the port 6.

It will be understood, of course, that the oil entering the valve casing fills the chamber 7 and, by its pressure on the larger lower end of the piston, lifts the piston to its seat at the port 6. To unseat the piston, there is provided a plunger or push-rod 13 which is slidably mounted through the cap 14, secured upon and closing the upper end of the casing, and is adapted to extend through the port 6 and bear upon the upper end of the piston. This rod 13 is pivoted at its upper end to a hand lever 15 and is provided with a lateral extension or arm 16 which projects above the lever. The lever is fulcrumed upon the upper end of a rocking standard 17 mounted on the cap 14, and on the upper end of the arm 16 is pivoted an eccentric lever 18 adapted to bear upon the upper side of the hand setting lever 15. Normally the piston will be held in the open position shown in the drawing, the pivotal connection between the lever and the rod being slightly below the horizontal plane of the connection between the lever and the standard, but, as the supporting standard 17 may rock, the automatic closing of the valve under the abnormal condition will be permitted.

A vent passage 19 is made in the valve piston to permit the escape of any oil which may possibly find its way into the space above the shoulder 12, and the inner end of this vent passage is located at the center of the lower end of the piston. At the said end of the vent passage is provided a valve 20 which liberates the trapped oil and permits the piston to seat very quickly when the pressure at the delivery side of the

device drops suddenly. The lower end of the valve casing and the pressure chamber 7 is closed by a cap 21 secured to the casing, and threaded through the cap is a rod or stem 22 which is adapted to bear against the lower end of the valve and thereby limit the lowering opening movement of the same. The stem is equipped with a handle 23 at its lower end and, above said end, a locking plate 24 is secured thereto. A post 25 having a threaded lower portion 26, is secured to and depends from the cap 21 parallel with the stem 22 and passes through an opening provided therefor in a plate 27 which fits loosely about the stem and rests on the locking plate 24. The plates 24 and 27 are provided with openings therethrough which are adapted to register and a pin 28 is inserted through the registering openings to hold the plates in set relation. A nut 29 is mounted on the post 25 and bears upon the plate 27. If the nut be adjusted upwardly on the hanger post 25 and the pin 28 withdrawn, the stem 22 may be rotated and thereby moved endwise owing to its threaded engagement with the cap 21, being thus set to permit downward movement of the valve 9 to the desired degree in an obvious manner. After the stem is set, the nut 29 is manipulated to hold the plate 27 close upon the plate 24 and the pin 28 is replaced, the parts being locked in the position in which they are set. The piston valve 9 may thus be set and held at any desired distance from its seat and, consequently, the quantity of oil passing into the delivery line may be easily regulated.

When the oil is admitted to the valve casing, it will fill the pressure chamber and rise to the port 6 through which it will flow if the valve 9 be lowered. Assuming the valve to be open, oil will be acting directly upon both ends thereof and, as the lower end is larger than the upper end, will tend constantly to lift and close the valve. This tendency, however, is effectually resisted by the rod 13 so that as long as conditions are normal oil will be delivered. Should a leak, however, develop in the delivery line, the back pressure will be reduced at the top of the valve and the greater pressure at the bottom thereof will at once lift it to closed position and the flow will be cut off. The locking eccentric lever 18 is set in the locking position until the initial circulation through the system is established and it is then manually released so that upon the development of a leak, the piston will be free to rise as described. When the piston has been lifted to closed position in the stated manner, it will remain closed until again opened by manual depression of the lever 15 so that a premature opening of the valve cannot occur.

Having fully described my invention what

I claim as new and desire to secure by Letters-Patent, is:—

1. The combination of a valve casing comprising an inlet passage, an outlet passage and a port between the passages, a free piston valve therein having both its ends exposed constantly to direct pressure of fluid normally flowing through the casing and having one end presented axially to said port to seat thereon, the end remote from the valve seat being of greater area than the end nearer the seat whereby the pressure tends constantly to seat the valve, manually controlled means arranged to act on the valve to unseat the same, and means for locking the unseating means whereby to hold the valve open.

2. The combination of a valve casing, a free piston valve therein having both its ends exposed to pressure of fluid flowing through the casing, the end remote from the valve seat being of greater area than the end nearer the seat whereby the pressure tends constantly to seat the valve, a rod slidably mounted in the casing in position to bear upon the smaller end of the valve, a lever supported on the casing for rocking movement and pivotally attached to the upper end of the rod, a laterally extending arm at the upper end of the rod, and an eccentric mounted on said arm and bearing on the lever to lock the lever and hold the valve in open position.

3. The combination of a valve casing, a free piston valve therein having both its ends exposed to direct pressure of a fluid admitted to and normally flowing continuously through the casing, manually controlled means for unseating the valve and holding it normally unseated, means for limiting the movement imparted to the valve by said manually controlled means, and means for locking the last-mentioned means in a set position.

4. The combination of a valve casing, a free piston valve mounted in the casing and tending constantly to seat under pressure of a fluid admitted to the casing, means to act on one end of the valve for unseating the same, an endwise movable stem mounted in one side of the casing to engage the opposite end of the valve to limit the unseating movement, a locking plate carried by said stem, a coacting plate fitting loosely upon the stem and bearing against the locking plate, means to prevent rotation of the coacting plate, and means to hold the plates in a set relation.

5. The combination of a valve casing, a free piston valve therein having both its ends exposed to direct pressure of a fluid admitted to and normally flowing continuously through the casing, manually controlled means for unseating the valve and holding it normally unseated, and means for limiting the movement imparted to the valve by

said manually controlled means, the valve having a vent therethrough leading away from its seating end.

5 6. The combination of a valve casing, a free piston valve therein having both ends exposed to direct pressure of a fluid admitted to and normally flowing continuously through the casing, manually controlled means for unseating the valve and holding

it normally unseated, means for limiting the movement imparted to the valve by said manually-controlled means, the valve having a vent leading away from its seating end, and a valve for said vent. 10

In testimony whereof, I have signed this specification. 15

FREDERICK HEATH.