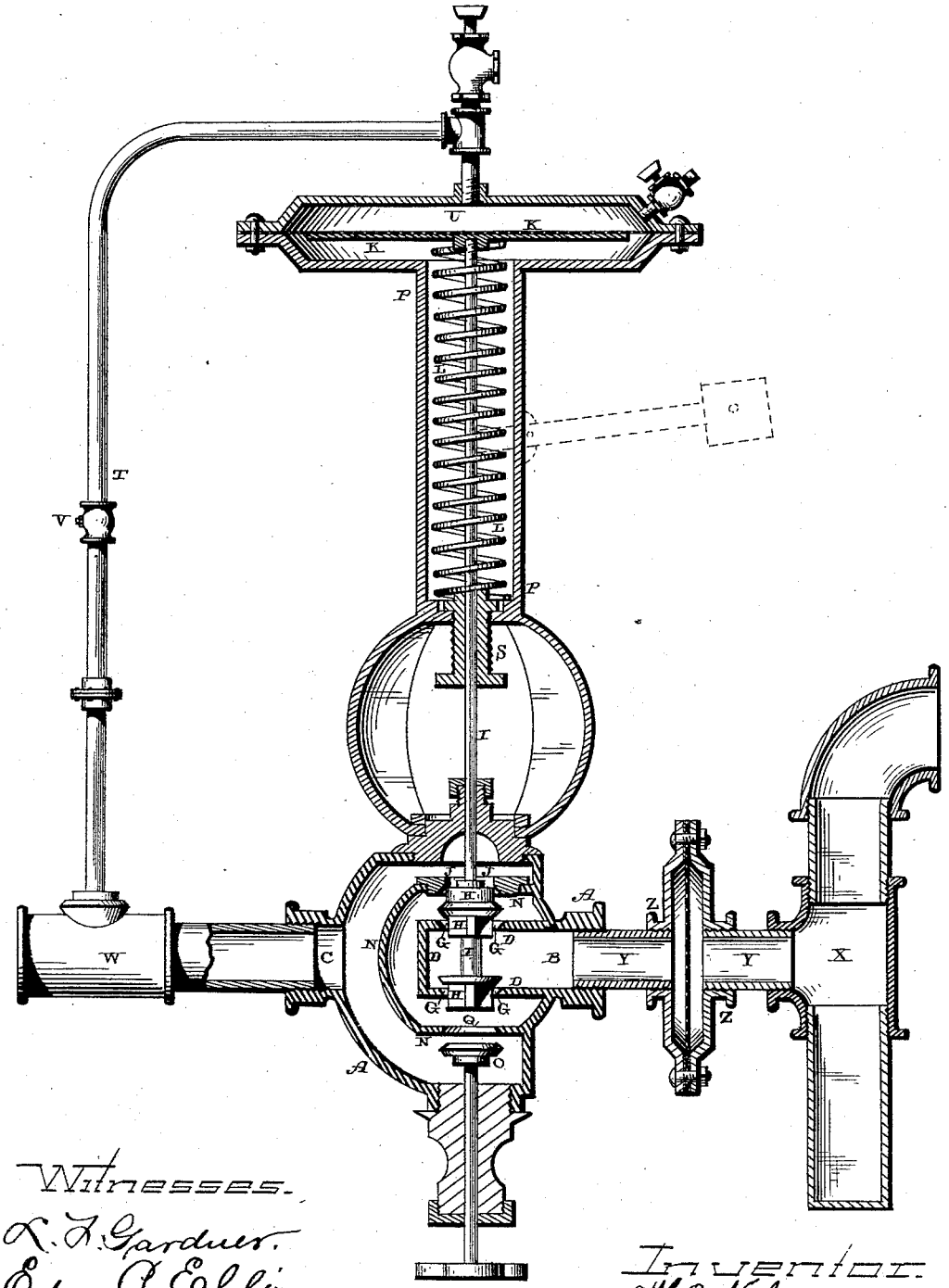
(No Model.)

M. O. HALDEMAN.

REGULATING VALVE.

No. 385,619. Patented July 3, 1888.



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UNITED STATES PATENT OFFICE.

MELVILLE O. HALDEMAN, OF INDIANAPOLIS, INDIANA.

REGULATING-VALVE.

SPECIFICATION forming part of Letters Patent No. 385,619, dated July 3, 1888.

Application filed February 21, 1888. Serial No. 264,835. (No model.)

To all whom it may concern:

Be it known that I, MELVILLE ORLANDO HALDEMAN, of Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Regulating-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 pertains to make and use it, reference being had to the accompanying drawing, which forms part of this specification.

My invention relates to an improvement in regulating-valves; and it consists in, first, the combination of the shell or frame-work, two partitions provided with valve-seats and formed as a part of the frame work, two valves placed upon the same rod, and which are made to operate in connection with three valve-seats, a spring applied to the valve-stem, a diaphragm, and a pipe which conveys the steam or gas to the chamber above the diaphragm; second, the combination, with the shell or frame of the valve, having a partition formed therein and provided with a valve-seat, of an independent valve which is to be operated by hand, all of which will be more fully described hereinafter.

The object of my invention is to produce a pressure-regulating valve which will automatically close in case of a burst diaphragm or head, broken levers, or temporary failure of the feeding-pressure, and to provide the shell with an independent by-pass valve which can be used when the valve is out of working order.

The accompanying drawing represents a vertical section of a pressure-regulating valve which embodies my invention.

X represents the trap placed between the main gas-pipe and the inlet-pipe Y, and which is formed of a suitable length of vertical pipe of larger diameter than the pipe Y, for the purpose of breaking the force of the current or flow of fluid before it enters the pipe Y. The inlet-pipe Y is attached to the shell A at one end and to the flange-union Z at the other, and in the union is placed a piece of gauze, which serves to intercept pieces of scale or dirt and prevent them from entering the shell and lodging on the valve-seats.

The shell or frame A of the valve is provided with an inlet, B, and an outlet, C. Cast with and forming part of the shell A is the partition D, which extends horizontally across the central portion of the shell in a line with the inlet and outlet, and which is closed at its inner end. Through this partition are made the two valve-seats G, through which the fluid must pass, and which valve seats are controlled by the valves H on the stem I. The lower valve H is intended to simply close the lower seat G for the purpose of regulating the flow of fluid through it; but the upper valve H is made double, and is intended to both regulate the flow of fluid through the upper valve seat G and to positively close against the valve-seat J, which is made in the partition N. This partition N entirely incloses the partition D, as shown, and has formed through it the valve-seat J, which is controlled by the double valve H. Between the two partitions D N there is left a sufficient space to allow the free passage of all of the fluid which passes through the lower valve seat G around to the valve-seat J.

By forming two partitions in the shell or frame A and providing them with the three valve seats, two valves can be used in connection therewith, be perfectly balanced, and made very sensitive to the varying pressure of the fluid which is passing through the shell. The fluid passes equally through the two valve-seats G and through the single valve-seat J, and then out through the outlet C. When the valves H are forced upward by the spring L, connected to the stem I, the upper valve H closes the valve-seat J, and then no fluid can pass through the frame A unless the by-pass valve O is operated. As shown, the stem of this valve O passes down through the lower end of the frame A, and is provided with the hand-wheel, so that it can be operated at any time. This valve O controls the valve-seat Q, made in the lower portion of the partition N, and is to be operated when the upper valve H has been made to close the valve-seat J, so that no fluid can pass through the shell. By opening the valve O the fluid is allowed to pass through the valve-seat Q, around the partition N, and out at the outlet C, and thus a means is afforded for allowing the fluid to pass through the shell independently of the valve H.

The stem I passes up through the frame P,

in which the spring L and the diaphragm K are placed. The upper end of the spring bears against the lower seat of the diaphragm, and the pressure of the spring is regulated by means of the screw S. The greater the tension of the spring L against the diaphragm the greater the tendency of the upper valve H to close against the valve-seat J, and thus shut off the flow of fluid through the shell.

Connected to the outlet C is a pipe, W, and leading from this pipe W is the pipe T, which extends upward and is connected with the chamber U above the diaphragm. This pipe T is provided with a suitable stop-cock, V, by means of which the pressure can be turned on and shut off from the diaphragm at will. The fluid passes through the pipe W to any desired source, and a portion of the pressure in the pipe W is communicated, through the pipe T, to the diaphragm, so as to overcome the tension of the spring L. Should the flow of fluid be shut off from any cause, the pressure is at once removed from the diaphragm, and the spring then causes the upper valve H to close the valve seat J. By regulating the tension of the spring L to the pressure of fluid passing through the shell A, the diaphragm is made to balance the valves H, so as to regulate the amount of fluid passing through the shell A.

My invention is adapted for regulating the pressure of either a solid or gaseous fluid, and may be applied for regulating the pressure of natural gas or steam. Should the supply be suddenly shut off and the upper valve H made to close against the valve-seat J by the spring L, so as to absolutely cut off the flow of fluid through the shell, it is only necessary to open the by-pass O until the pressure of the fluid has become established in the pipe W, when a portion of it passing through the pipe T will cause the diaphragm to operate and balance the valves H in relation to the valve-seat G. In case it is not desired to use the spring for regulating the pressure of the fluid upon the diaphragm, a weighted lever may be used, as shown in dotted lines, and which is connected at its inner end to the stem.

Having thus described my invention, I claim—

1. The combination of the shell, provided with the two separate partitions and the three valve-seats G J, and the two valves attached to a single stem, one of the said valves being made double-seated, a diaphragm, and a spring or weight, substantially as described.

2. The combination of the shell, provided with two partitions having the valve-seats G J Q, with the valves H, which are operated by a diaphragm, and the independent valve O, substantially as specified.

3. The combination of the shell, provided with the partition D, which extends inward from the inlet B, and is provided with two valve-seats, and a separate partition, N, which entirely incloses the one D, and is provided with the valve-seat J, with the valve-rod, valves secured thereto, the spring, and diaphragm, there being a passage between the two partitions for the passage of the gas, substantially as specified.

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

MELVILLE O. HALDEMAN.

Witnesses:

JAMES B. MCELWAINE,

JAMES B. WHEELER.