No. 773,641. PATENTED NOV. 1, 1904.

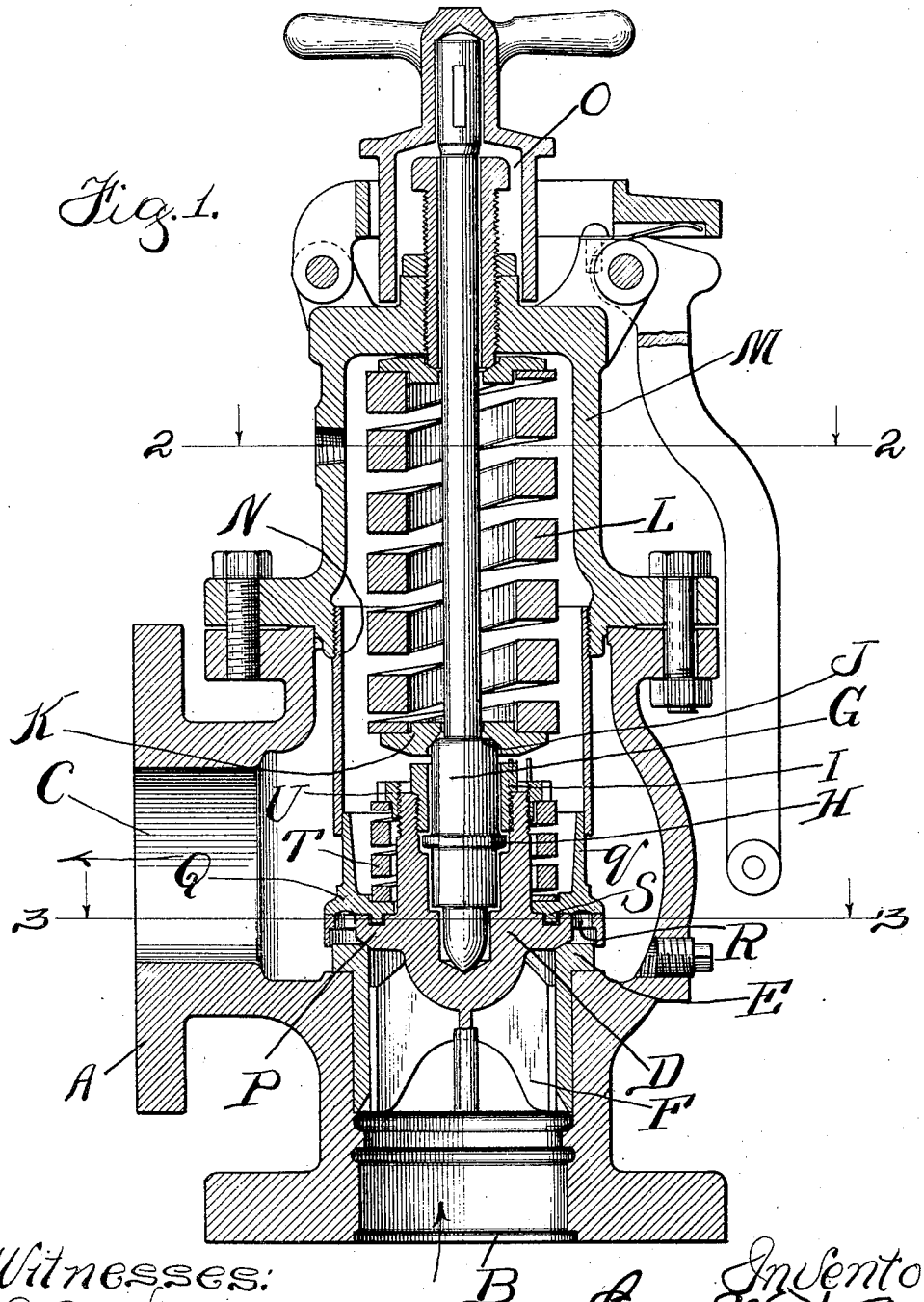
G. W. HAYDEN.

VALVE.

APPLICATION FILED AUG. 19, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



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VALVE.

APPLICATION FILED AUG. 19, 1904.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

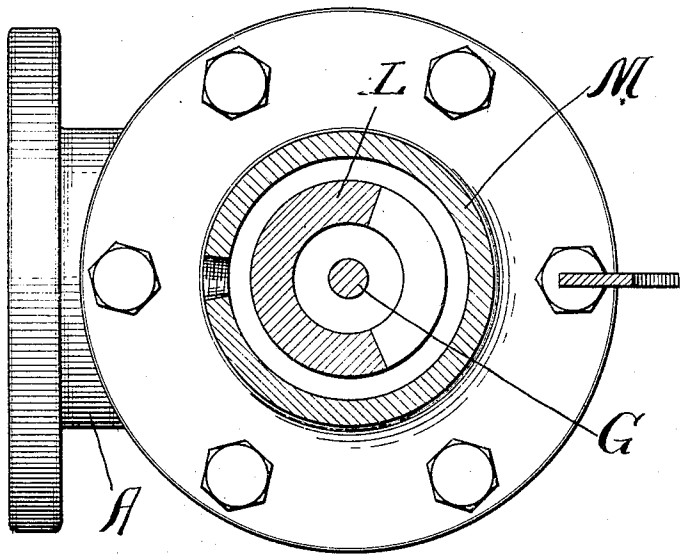
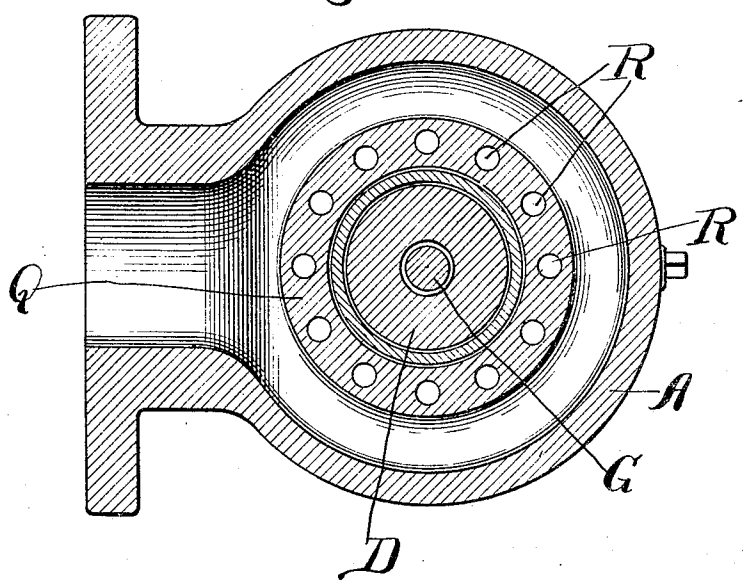


Fig. 3.



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No. 773,641. Patented November 1, 1904.

UNITED STATES PATENT OFFICE.

GEORGE W. HAYDEN, OF OAK PARK, ILLINOIS, ASSIGNOR TO CRANE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

VALVE.

SPECIFICATION forming part of Letters Patent No. 773,641, dated November 1, 1904.

Application filed August 19, 1904. Serial No. 221,335. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. HAYDEN, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Valves, of which the following is a specification.

The object of my invention is to provide a simple, strong, reliable, inexpensive, and sensitive safety-valve in which the springs shall be effectively protected from contact with the steam which passes through the valve, and thus protected against corrosion, and at the same time steam-pressure upon the upper surface of the valve is avoided. This and such other objects as may hereinafter appear are attained by my invention, a convenient embodiment of which is disclosed in the accompanying drawings, in which—

Figure 1 is a vertical sectional view of my valve. Fig. 2 is a horizontal sectional view on the line 2 2 of Fig. 1 looking in the direction indicated by the arrows, and Fig. 3 is a horizontal sectional view on the line 3 3 of Fig. 1 looking in the direction indicated by the arrows.

Like letters of reference indicate the same parts in the several figures of the drawings.

Referring by letter to the accompanying drawings, A indicates a casing provided with an inlet-port B and an outlet-port C. Communication between the inlet-port and outlet-port is normally closed by a main valve D, which rests upon a valve-seat E and is provided with guide-wings F and with a valve-stem G. The valve-stem G is provided with a shoulder H, against which abuts a nipple I, which is screwed into the upper part of the main valve D. The valve-stem G is also provided with a shoulder J, upon which rests a collar K, which carries the main valve-spring L.

The casing A is provided with a cap-piece M, which fits over the main valve-spring L and to which is secured a downwardly-extending cylindrical sheath N, which surrounds the lower portion of the main valve-spring L. The valve-stem G extends upwardly through the spring L and the cap-piece M and through a stuffing-box O, which is mounted upon the top of the cap-piece M.

The main valve D is provided with a grooved shoulder P, upon which rests an annular supplemental valve Q. The shoulder P upon the main valve is provided with supplemental steam-ports R, which are normally closed by the supplemental valve Q, and the supplemental valve Q is provided with an upwardly-extending cylindrical portion *q*, which has a snug sliding fit within the sheath N. The supplemental valve Q is provided with an inwardly-extending flange S, upon which rests the auxiliary spring T, the upper end of said auxiliary spring T abutting against a flange upon a nipple U, which is secured to the upper portion of the main valve D. It will thus be seen that the main spring L and the auxiliary spring T are normally inclosed within a chamber formed by the cap-piece M, the sheath N, the supplemental valve Q, and the main valve D.

In the operation of my device embodied in the form above described a slight excess of steam-pressure above a predetermined point will raise the main valve D from its seat and against the pressure of the heavy spring L, thus giving the steam access to the huddling-chamber formed on the under side of the flange of the main valve and to the auxiliary steam-ports R, where the steam-pressure will be exerted against the auxiliary valve Q, which is held to its seat by the relatively light spring T. As a result, the pressure which has been sufficient to slightly unseat the main valve against the heavy spring L will freely unseat the supplemental valve against the light spring T, and the steam will be given a free vent to the atmosphere not only through the main valve, but also through the auxiliary valve, thus providing a double exit to the atmosphere and a resulting quick reduction of pressure. As soon, however, as the steam-pressure is sufficiently reduced the main spring L will close the main valve, thereby cutting off steam from the auxiliary valve, whereupon the auxiliary valve will at once close.

It will be seen that when the auxiliary valve

is open it affords a direct passage of the steam in the outlet-chamber of the valve-casing; but owing to the fact of the co-engagement between the annular shoulder on the supplemental valve and the groove in the upper side of the flange of the main valve only a small tortuous passage is afforded leading from the ports R to the chamber occupied by the springs, so that the passage of steam in that direction is retarded. Such passage is further retarded by the fit between the supplemental valve Q and the vertical portion of the main valve D, so that both valve-springs are effectively protected against contact with the steam, and steam-pressure upon the upper surface of the valve is at the same time avoided.

Obviously my invention may be embodied in other forms without departing from the spirit thereof.

I claim—

1. A valve comprising a casing containing a main valve, a supplemental valve mounted upon said main valve, a main valve-spring and a supplemental valve-spring, and a sheath mounted within said casing and telescoping with a portion of the supplemental valve, whereby the valve-springs are inclosed and protected against steam passing through the casing.

2. A valve comprising a casing, a main valve, a spring arranged to hold said main valve normally seated within said casing, a supplemental valve mounted upon said main valve, a spring arranged to hold said supplemental valve normally seated within said casing, and means for inclosing said springs so as to exclude steam therefrom.

3. A valve comprising a casing, a main valve, a spring arranged to hold said main valve normally seated therein, said main valve being provided with a vertical portion and with a horizontal flange, a supplemental valve seated upon the flange of said main valve and arranged to reciprocate upon the vertical portion of said main valve, a spring arranged to hold said supplemental valve normally seated upon said main valve, and means for excluding steam from the space containing said springs, said means including a groove formed upon the upper face of the flange of the main valve, and a complementary projection formed upon the under face of said supplemental valve and arranged to fit within said groove.

GEORGE W. HAYDEN.

Witnesses:
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