(No Model.)

H. F. HODGES.

PRESSURE REGULATING VALVE.

No. 323,039. Patented July 28, 1885.

FIG. 1.

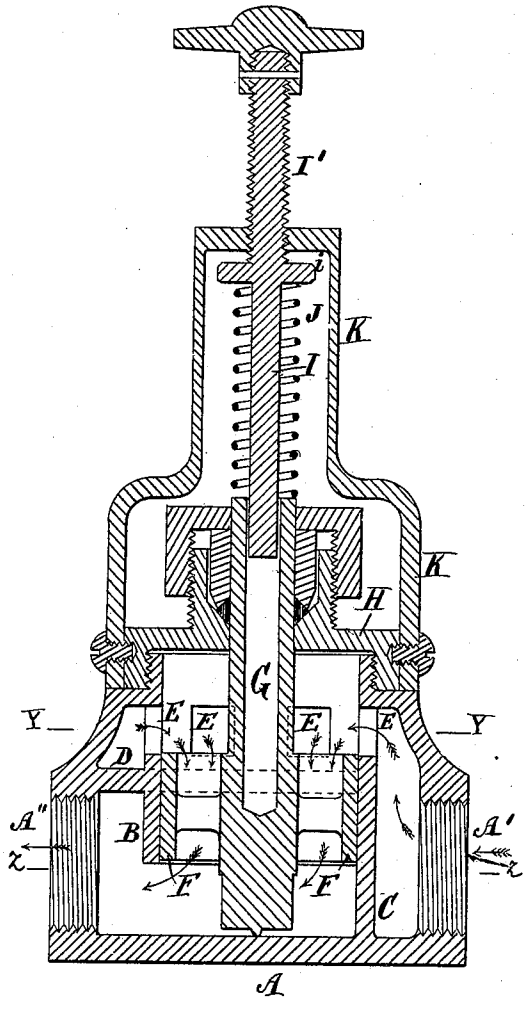


FIG. 2.

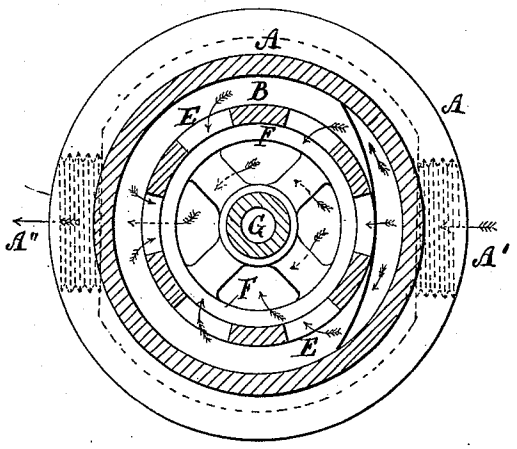
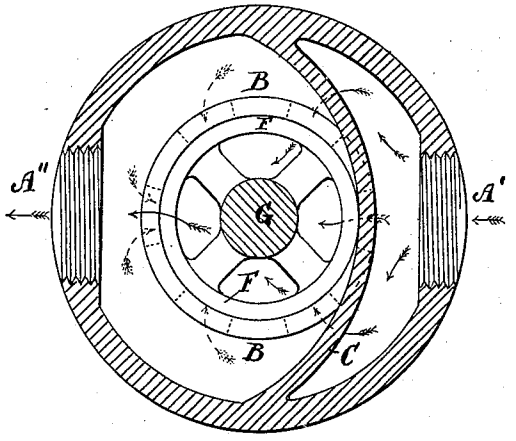


FIG. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

HORACE F. HODGES, OF BOSTON, ASSIGNOR TO CHARLES F. PAINE, OF GROVELAND, AND GEORGE H. SPENCER AND CHARLES T. CROCKER, OF FITCHBURG, MASSACHUSETTS.

PRESSURE-REGULATING VALVE.

SPECIFICATION forming part of Letters Patent No. 323,039, dated July 28, 1885.

Application filed June 28, 1884. (No model.)

To all whom it may concern:

Be it known that I, HORACE F. HODGES, a citizen of the United States, residing at Boston, (Charlestown,) in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Pressure-Regulating Valves, of which the following is a specification.

My invention relates to certain improvements in pressure-regulating valves, with especial reference to that described in Patent No. 290,429, issued to me December 18, 1883, the object of my present invention being to simplify the same, lessen its friction, and provide a more advantageous outlet-passage for the steam.

In the above-named patent I have shown a perfectly-balanced valve, the stem of which passes through stuffing-boxes at both ends, the valve being situated in the high-steam chamber, and one end of the valve-stem projecting through a stuffing-box into the low-steam chamber, whereby the area of said end is evidently affected by the low-pressure steam.

In my present improvement the valve is situated in the low-pressure chamber, the valve-stem passes through a stuffing-box at but one end, and the valve is not perfectly balanced, inasmuch as the low-pressure steam which surrounds the valve acts upon the area of the free end of the valve-stem to destroy its equilibrium.

In the accompanying drawings, Figure 1 is a vertical section of a valve embodying my improvements. Fig. 2 is a transverse section on the line *y y* of Fig. 1, and Fig. 3 is a transverse section on the line *z z* of Fig. 1.

A is the body of the valve, A′ being the inlet and A″ the outlet passage. B is a cylinder forming a part of the body A and cast with it. The upper end of cylinder B communicates with the inlet-passage A′ by means of the equidistant ports E E, its upper end being closed by the head and stuffing-box H, while its lower end is fully open to the outlet-passage A″, but is prevented from communication with the inlet-passages A′ by means of the vertical partition C and the horizontal floor D, the latter being partly shown by dotted lines in Fig. 1.

F is a tubular valve open from end to end, secured to and adapted to be moved by the valve-rod G and fitting within the cylinder B. The valve F is attached to the valve-rod G at such point that when the valve-rod is at its lowest point, as shown in Fig. 1, it in no manner obstructs the passage of the steam through the ports E E into cylinder B. The valve-rod G is made hollow the greater part of its upper portion, and projects out of the valve through the head and stuffing-box H, which are properly secured to the body A.

I is a regulating-rod having a fixed collar, *i*, at or near the center of its length. Below the collar *i* the rod is made to fit loosely within the hollow end of the valve-stem G, and is surrounded by a coiled spring, J, which is held against the collar *i* and the valve-stem G, as shown, and serves as a resistant to the upward movement of the valve-stem G. Above the collar *i* the rod is screw-threaded, as shown at I′, and provided at its upper end with a suitable disk for turning the same. The threaded portion I′ passes through a female thread in the top of the support K, which is properly secured to the top of the valve-body A, and is open to the atmosphere.

The operation is as follows: Steam entering the passage A′ passes in the direction of the arrows through the equidistant ports E E and enters cylinder B, thence passing through the center of valve F and out at the passage A″, and will continue so to pass until the pressure upon the lower end of the valve-stem G overcomes the resistance of the spring J. When the pressure exceeds the resistance of the spring J, the valve-stem G, and with it the valve F, is forced upward, thereby closing the ports E E more or less and diminishing or entirely preventing the passage of steam through the same, thus cutting off the supply. As the pressure within the valve falls below that prescribed, the tension of the spring exceeds the pressure upon the lower end of the valve-stem and the latter will be forced downward, thus opening the valve to a fuller admission of the steam. It is obvious that the pressure in cylinder B will be thus maintained at a point sufficient to neutralize the tension of spring J. It will also be seen that by revolving the regulating-rod I I′ the tension of spring J may be varied within certain limits.

For ordinary purposes I prefer that the resistance to the closing of valve F shall be gov-

erned by the tension of the spring; but in some more delicate regulations a fixed weight would be more desirable, in which case the supporting-cap K, with the regulating rod and spring, is removed, and the action of gravity by means of weights upon the upper end of valve-rod G substituted.

What I claim as my invention is—

1. In a pressure-regulating valve, a cylinder open at its lower end and provided with equidistant ports in its walls, and containing a tubular valve open from end to end and fitted to slide in said cylinder, in combination with a valve-stem, one end of which passes out of said valve through a stuffing-box to the atmosphere, and provided with a variable tension device, substantially as set forth.

2. The combination of the body A, provided with inlet and outlet passages, the cylinder B, partition C, floor D, the equidistant ports E E, valve F, valve-rod G, head H, regulating-rod I I′, spring J, and supporting-cap K, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HORACE F. HODGES.

Witnesses:

JOS. H. ADAMS,

E. PLANTA.