

J. A. COOK.
Steam-Valve.

No. 216,834.

Patented June 24, 1879.

Fig. 1

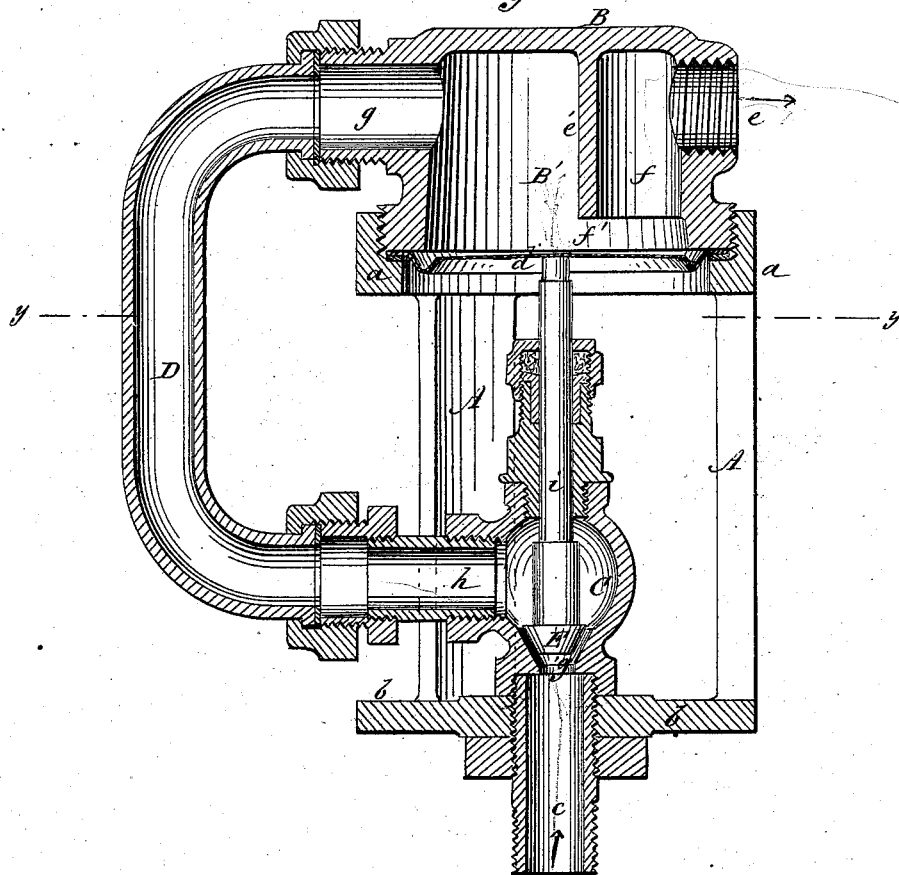
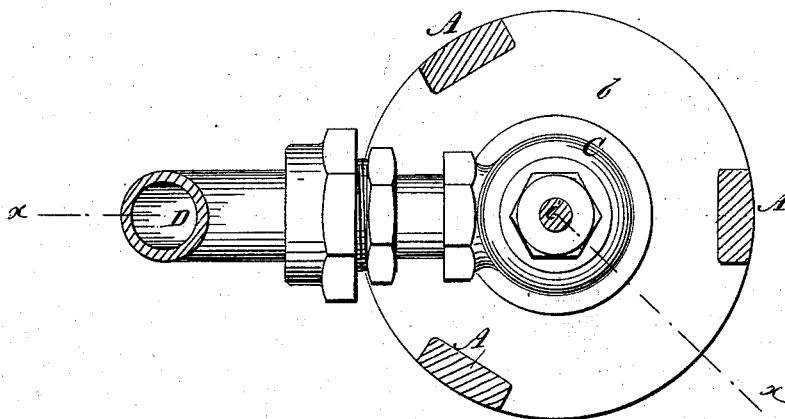


Fig. 2



WITNESSES:

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IMPROVEMENT IN STEAM-VALVES.

Specification forming part of Letters Patent No. **216,834**, dated June 24, 1879; application filed December 4, 1878.

To all whom it may concern:

Be it known that I, JOSEPH A. COOK, of Auburn, in the county of Cayuga and State of New York, have invented a new and Improved Steam-Valve, of which the following is a specification.

The object of this invention is to provide a self-adjusting valve for regulating the pressure and supply of steam for heating purposes in dwelling-houses, public buildings, &c.

It consists of a valve seated and inclosed in a chamber just over the end of the supply-pipe, with its stem passing through said chamber, and thence to a diaphragm, forming the bottom of a second chamber, from whence proceeds the distributing-pipe, while the two chambers are connected by a pipe, whereby, when the steam passes by the valve, it flows upward to the second chamber, and when the pressure exceeds the desired amount it presses the diaphragm down upon the valve-stem and closes the valve, thus cutting off the supply of steam, and when the pressure in the upper chamber is lowered the valve opens, admitting more steam.

In the accompanying drawings, Figure 1 is a vertical section of my improvement on line *x x*, Fig. 2; and Fig. 2 is a horizontal section on line *y y*, Fig. 1.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the frame supporting the valve, having a crown, *a*, and bottom *b*. Through the latter, in the center, is passed the supply-pipe *c*, and in the crown is screwed the cylindrical cast-metal cap B, between the lower edge whereof and the crown are secured the edges of a circular diaphragm, *d*, made of thin metal, brass preferably, so as to bend or spring slightly in the middle. Cap B has on one side a threaded socket, *e*, and adjacent to this socket is a hanging partition, *e'*, dividing off a small chamber, *f*, from the principal chamber, *B'*, but communicating therewith by a passage-way, *f'*, between the edge of the partition and the diaphragm. On the opposite side of cap B is a hollow cylindrical projection, *g*.

The upper end of the supply-pipe *c* is joined above the bottom *b* to the lower end of the

valve-chamber C, having a valve-seat, *g'*. From the side of the valve-chamber C projects a pipe, *h*, joining one end of a U-shaped pipe, D, the other end whereof is joined to the projecting piece *g* from chamber *B'*. Communication is thus established between the service or supply pipe *c* and distributing-pipe attached at *e* through valve-chamber C, pipe *h*, U-shaped pipe D, chamber *B'*, thence through passage *f'* to chamber *f*.

E represents the valve in chamber C, its stem *i* projecting through a stuffing-box in the upper part of the valve-chamber, and thence to the diaphragm *d*.

When the pressure from the main is allowed to lift the valve, the superficial area of the diaphragm must largely exceed that of the valve E; but the diaphragm must be adjusted with respect to the valve, as shown in Fig. 1, so as not to interfere with the flow of steam, except under the conditions hereinafter named.

The operation of my invention is as follows: When the proper pressure of steam is in the distributing-pipes and registers the valve is held up from the seat, as in Fig. 1; but when it exceeds the proper amount it presses upon the diaphragm *d* in chamber *B'*, and, bending it, the valve E is forced down on its seat, thus closing the passage and shutting off the steam from the mains, and this continues until the pressure in chamber *B'* is reduced sufficiently to allow the pressure from the mains to force the valve up and open the passage for the flow of the steam. In this way, by the closing of the valve E through the action of the diaphragm *d*, and opening it by the pressure from the main on the bottom of the valve, the steam is alternately shut off and let on, whereby a medium pressure of the proper amount is maintained in the distributing-pipes and registers, thus obviating all danger of the bursting of the pipes or the leakage of the steam.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. As an improvement in valves for regulating the pressure of steam in distributing-pipes and registers, the valve E, inclosed in chamber C, provided with valve-seat *g'*, and hav-

ing a stem, *i*, in combination with pipe D and chamber B', provided with a diaphragm, *d*, substantially as described.

2. As an improvement in valves for regulating the pressure of steam in distributing-pipes and registers, the combination and arrangement of chamber B', communicating with with distributing-pipes, the diaphragm *d*, valve-stem and valve E, valve-chamber C,

communicating with supply-pipe, and the U-shaped pipe D, for conveying the steam from the valve-chamber C to chamber B', substantially as described.

JOSEPH A. COOK.

Witnesses:

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M. L. WALLEY.