J. M. HARTMAN.

Valves for Regenerative Hot-Blast Stoves.

No. 206,173. Patented July 23, 1878.

Fig. 1

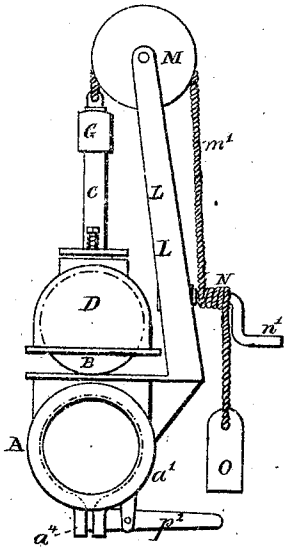


Fig. 2

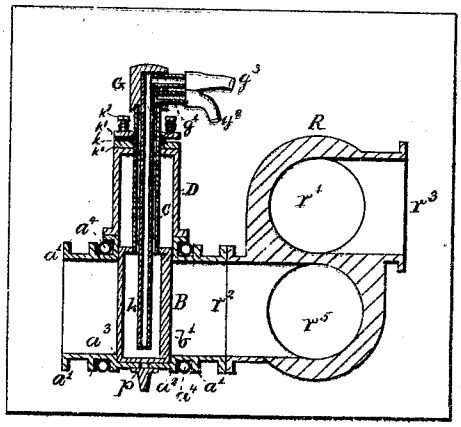


Fig. 3

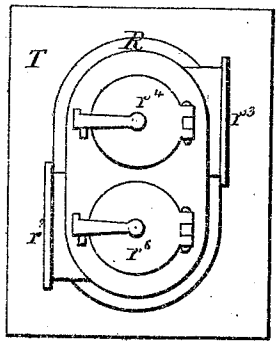


Fig. 4

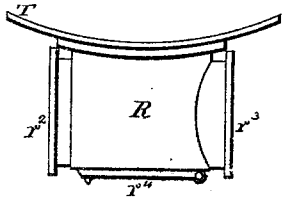


Fig. 5

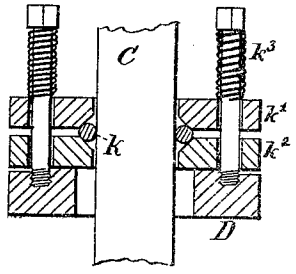
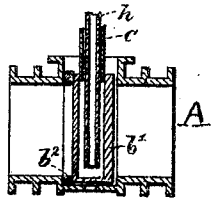


Fig. 6



Witnesses.

John F. Grant.

D. Louis Shives.

Inventor.

John M. Hartman

per Edw Brown

Attorney

UNITED STATES PATENT OFFICE.

JOHN M. HARTMAN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN VALVES FOR REGENERATIVE HOT-BLAST STOVES.

Specification forming part of Letters Patent No. **206,173**, dated July 23, 1878; application filed May 14, 1878.

To all whom it may concern:

Be it known that I, JOHN M. HARTMAN, of Philadelphia, Pennsylvania, have invented a new and useful Improvement in Valves for Regenerative Hot-Blast Stoves, which improvement is fully set forth in the following specification and accompanying drawing.

My invention relates to the use of slide-valves having the body and valve-body face and flanges all cast in one piece, and with cooling-passages cast in the body close to the valve-face, or with a cooling-coil in close contact with the valve-body face. The slide-valve is cast hollow, and has an arrangement of pipes for the circulation of water or air within the valve.

The invention further relates to the combination, with the valve-body and sliding valve, of a removable cap and counterbalanced hoisting-gear, whereby the cap of the body which covers the valve can be lifted up with the valve free from the body; also, to the attachment of the valve to the shell of the stove, and to the packing of the valve-spindle.

In the drawing, Figure 1 is an elevation of the valve and hoisting-gear. Fig. 2 is a longitudinal section through the valve and compound valve attachment. Fig. 3 is a front elevation of the compound valve attachment. Fig. 4 is a plan of the same. Fig. 5 is a section through the valve-spindle stuffing-box.

I cast my valve-body A with the flanges a^1 and valve-body face a^3 all in one piece, and introduce a water-coil, a^4, around the body in contact with the body-seat and between the flanges a^1 a^2. The valve B is of cast-iron and hollow, and is made to slide upon the face a^3 of the valve-body. To the top of the valve is secured a tube, C, which passes upward through the cap D into a socket, G, and there communicates with an outlet-pipe, g^1, and a flexible tube, g^2. Within this tube is another pipe, h, terminating near the bottom of the valve, and connected to the socket G and the inlet flexible pipe g^3. The water or air passes down the inside pipe h and out between the annular space between the pipes.

In the use of valves on regenerative stoves difficulty is experienced in obtaining a gland that will not leak, and yet work easy, and permit the valve to seat itself properly when the gland is not in line. To accomplish this result, I make a gland packed with a brass-wire ring, k. Two flanges, k^1 k^2, are slipped over the tube C, and held in contact with the cap D by spring-bolts k^3. These flanges are each turned with a conical face inside, by which pressure is exerted against the ring k and the sliding joint kept always tight. These flanges have a small lateral motion or play upon the top of the cap D, which prevents the stem binding and insures the valve fitting accurately against its face. As an additional security I cast one side of valve b^1, which is farthest from the face, heavier than the other side. This throws the valve against the opposite side, thereby scraping off any accumulation of dust upon the face and preventing any leakage of air.

I also make the face of the valve with a ring, b^2, of composition, such as copper and tin, also the face of the body with a similar ring, b^2, as shown in Fig. 6. This makes the faces less liable to rust and the valves much more durable.

An arm, L, is secured to the valve-body, carrying a sheave, M, over which passes a chain or wire rope, m', which is secured at one end to the socket G and at the other end passes around the winding-drum N, and terminates in a counterbalance-weight, O. By turning the handle n' the valve is raised into the cap D, when, if the bolts connecting the cap are removed, the cap will be raised clear from the body A, as shown in Fig. 1, so that the valve and face can be cleaned when required. At the bottom of the valve-body I place a dust-valve, p, operated by a handle, p^2, for the discharge of dust from the valve-chamber.

In the construction of regenerative fire-brick stoves the different connections of air, gas, hot-blast, and cleaning doors are attached to the shell or casing separately, causing numerous holes in the shell and brick-work. These different connections coming on one side of the stove interfere with the manipulation of the valves. To obviate this, I attach one body piece, R, only to one side of the stove, and on this body piece R, which has different nozzles, I attach the valves and doors. By this arrangement the same opening into the stove answers two purposes.

In the drawings 2, 3, and 4, R is the compound attachment; T, the shell of the stove. The respective inlet-branches of the attach-

ment R are provided with slide-valves, such as have been hereinbefore described. The attachment R is secured to the shell T of the stove, and the valve-body A to the said attachment, as shown in Fig. 2.

When the stove is on gas—that is, burning gas—the air enters at r^1 and burns the gas which is entering the inlet r^2 through the slide-valve attached thereto. When the stove is reversed and blast turned on, this same opening r^1 is used to pass off the blast through branch r^3, to which is attached a valve similar to that shown on the opposite side. The upper opening r^1 has an inlet-door, r^4, through which air is admitted to burn the gas. The lower opening r^5 is used to conduct the gas into the stove, and also for cleaning out the dirt which is removed through the cleaning-door r^6.

I use a similar compound attachment or nozzle on the chimney side of the stove, and attach thereto one of my slide-valves between the gas-outlet and the chimney.

I claim—

1. In hot-blast valves for regenerative fire-brick stoves, the valve-body A, cast in one piece with the flanges a^1 a^2, combined with the water-coil a^4 embraced by said flanges, and adapted to cool the seat portions of the valve-body, substantially as specified.

2. In hot-blast valves for regenerative stoves, the combination of a body, A, a sliding disk-valve having inlet and outlet cooling-pipes, and a removable cap for the reception of the valve, as herein described.

3. In hot-blast valves for regenerative stoves, the combination of the hollow sliding stem C, one or more adjustable flat plates, k^1 k^2, having beveled engaging-surfaces, as shown, for compressing a metallic packing-ring, k, against the stem by means of spring-bolts k^3, substantially as specified.

4. In hot-blast valves for regenerative stoves, the combination of the casing T, an inlet or outlet valve, and an intermediate attachment, R, having one or more openings, r^5 r^1, into the stove, each of which has two or more openings leading therefrom, substantially as set forth.

5. The valve-body A, sliding disk-valve B, and removable cover D, adapted when said valve is raised to receive the same, combined with a hoisting and counterbalancing gear, whereby the said valve and valve and cover may readily be removed from the said valve body, substantially as specified.

JOHN M. HARTMAN.

Witnesses:

EDWD. BROWN,

JOHN F. GRANT.