

G. PIERCE.
Globe-Valve.

No. 209,290.

Patented Oct. 22, 1878.

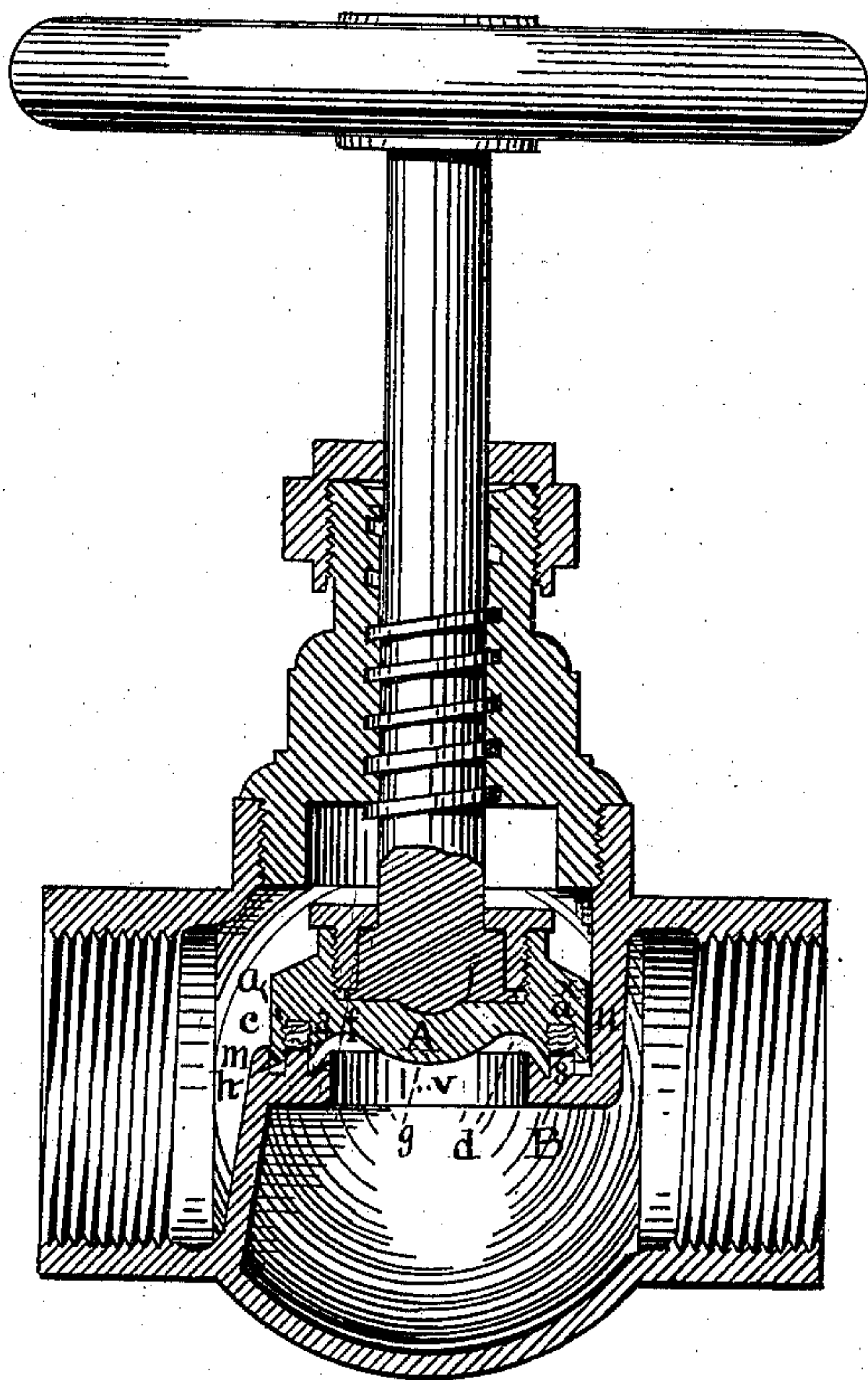


Fig. 1.

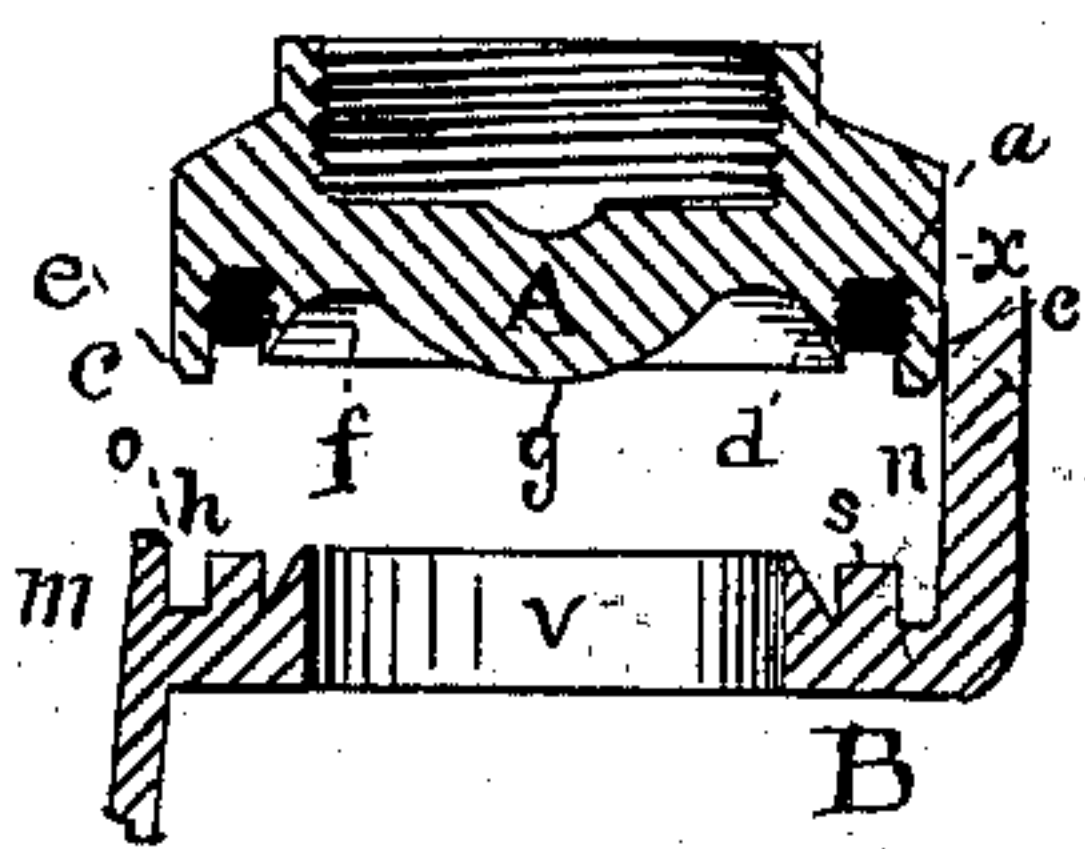


Fig. 2.

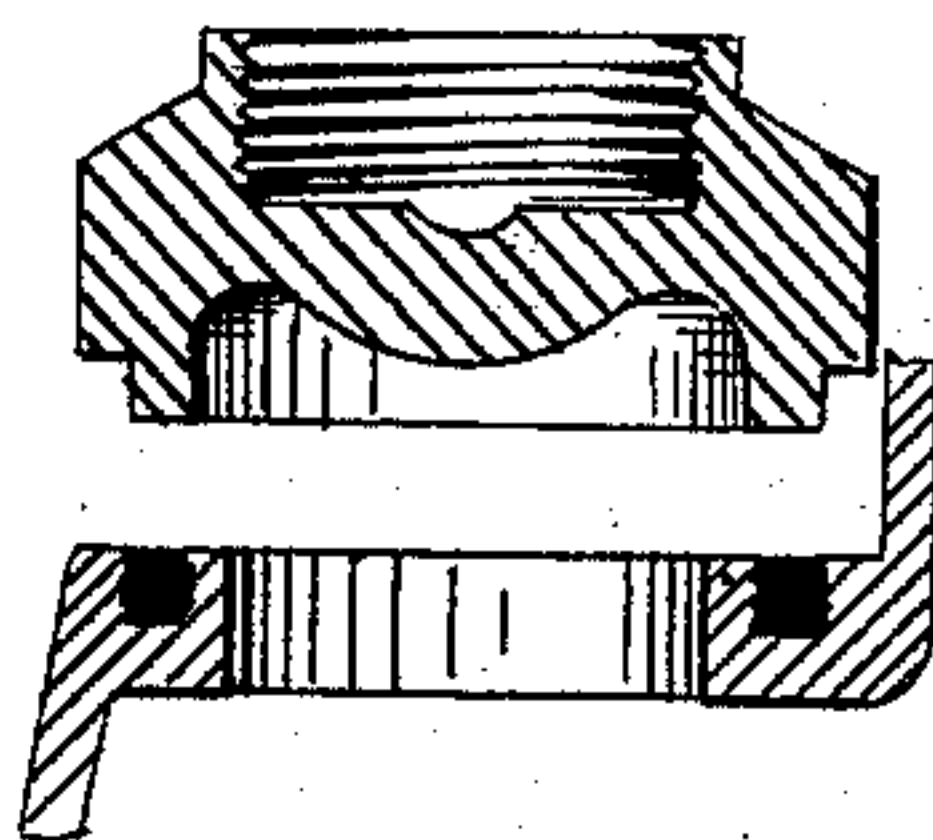


Fig. 3.

WITNESSES

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GEORGE PIERCE, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN GLOBE-VALVES.

Specification forming part of Letters Patent No. 209,290, dated October 22, 1878; application filed November 12, 1877.

To all whom it may concern:

Be it known that I, GEORGE PIERCE, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Globe-Valves, of which the following is a specification:

This invention relates particularly to the formation of the valve and the valve-seat, and their peculiar adaptation to each other, by which a comparatively soft or incoherent packing may be used, either in the valve or in the seat, but preferably in the former, without being abraded by the action of steam, hot water, or other gas or fluid passing through it, and without being ground out or comminuted, shutting upon a raised metal seat.

Reference is had to the accompanying drawing, forming a part of this specification, in explaining the nature of my invention, in which—

Figure 1 is a vertical section through the center of the valve, showing the stem in elevation; and Fig. 2 is a modification, whose differences will be hereinafter explained.

The operative parts of the valve are well known, and need no description here.

The valve A is provided upon its under surface with a recess, *a*, removed sufficiently from the edge of the valve to leave the exterior wall, *c*, which preferably is extended a trifle below the opposite wall, *d*, of the recess, and is slightly beveled on its lower outer corner at *e*.

The section of the under surface of the valve inclosed within the inner wall, *d*, which closes the steamway when the valve is shut, and is immediately in the path of the steam when the valve is opened, is provided with the concave recess *f*, surrounding a convex projection, *g*. This peculiar shaping, in connection with the formation of the diaphragm, as described below, deflects the steam, when the valve is open, in such a way that its direct action is prevented from striking the recess or the packing contained therein.

The diaphragm B has its upper surface formed into an exterior recess, *h*, which is partly surrounded by the wall *m* on the portion toward the exit, and which, on the other side, becomes the wall *n*, supporting the diaphragm, and is of a width just sufficient to allow the projecting wall *c* of the valve to

shut into it. The outer wall, *m*, preferably, is slightly higher than the other wall of the recess, and is somewhat beveled on its upper inner corner, *o*.

The recess *h* surrounds the raised seat *s*, which is arranged immediately under the recess *a*, and is of a width sufficient to shut into the recess and completely fill it without more than gently contacting with the side of the recess.

Inclosed by the raised seat, and projecting into the water-way, is the section V, which is an extension of the diaphragm B beyond the raised seat into the water-way, to prevent the steam when the valve is opened from spreading enough to injure the packing, as, if it were not for this interior section or ring V, the steam would act directly upon the packing in the recess of the valve, and would very soon destroy the efficiency and durability of a soft packing. This ring may be made flush with the top of the raised seat, or it may be cut away, as shown in Fig. 2, if the object of the invention, which is to prevent injury to the packing by the spread of the steam in its passage through the valve, is attained.

The wall *n* acts as a guide in centering the valve by the contact of the edge of the valve therewith.

The recess is filled or partly filled with any desirable packing, and, owing to the protection given the packing, I can use soft vulcanized rubber, asbestos, or asbestos mill-board. When asbestos is used it is somewhat compressed in the recess, and does not quite fill the same.

In operation, the valve is guided or centered by the wall *n* and the beveled corners *o e* on the outer walls, which are so arranged as to slightly contact as the valve approaches the seat.

I am aware that the patent granted R. T. Crane, May 30, 1876, No. 177,925, shows and describes a steam-valve in which a valve provided with a packing-holding recess is arranged to close upon a raised seat in such a way that a space for passage of steam over the edges of the seat exists after the raised seat enters the packing-holding recess and until the seat comes in contact with the packing; but I do not find therein any construction shown or described whereby the passage

of steam is entirely shut off the instant the top of the raised seat and the bottom of the valve come in line by the entrance of said raised seat within said recess and before said raised seat contacts with the packing.

I claim—

1. In a globe-valve, the combination of the valve A, provided with a recess, *a*, filled or partly filled with packing, with the diaphragm provided with an exterior recess, *h*, a raised seat, *s*, and an interior section, *V*, whereby the face of the packing is protected from injury from the direct action of the steam when the valve is open and the steam caused to contact with the metal face of the valve inclosed by said packing-recess, all arranged substantially as described.

2. In a globe-valve, the combination of a valve provided with an exterior wall, inclosing a packing, beveled on its lower outer corner, as shown, with a diaphragm, B, having a raised seat surrounded by recess *h*, and a wall, *m*, extending upwardly from the said diaphragm, and beveled on its inner upper corner, as described, so that the packing is centered upon the raised seat by the contacting with or impinging on of said lower outer corner of the exterior wall with said inner upper corner of wall *m*, substantially as described.

3. In a globe-valve, the combination of a valve having a recess partly filled with packing, and adapted to shut upon a raised seat, with a raised seat of sufficient width to completely shut or close the passage of the steam the instant the raised seat enters the recess and before contacting with the packing, whereby said packing is protected from the impinging action of the steam in closing, substantially as set forth.

4. In a globe-valve, the combination of the valve A, provided with an exterior wall, *c*, on its under surface, extended below the surface of the packing and the opposite wall, *d*, and beveled on its lower outer corner, and the recess filled or partly filled with packing, with the diaphragm B, having a raised seat surrounded by recess *h*, and a wall, *m*, extended upward above the level of the raised seat and beveled on its inner upper corner, whereby the packing is centered upon the raised seat, for the purpose set forth.

5. In a globe-valve, the combination of a valve having a recess rectangular in cross-section, filled or partly filled with packing, and adapted to shut upon a raised seat rectangular in cross-section, and with a raised seat sufficiently wide to completely close the recess when said raised seat enters said recess, whereby a straight passage is provided the steam and the packing protected from abrasion, substantially as and for the purpose described.

6. In a globe-valve, the combination of two seats, the one having a recess filled or partly filled with packing, and completely protected from the direct action of the steam by the section or ring *V* extended inwardly from the raised seat, as shown, and the other having a raised projection in width to completely fill said recess when first shut therein, substantially as described.

7. In a globe-valve, the combination of a valve provided with a recess filled or partly filled with packing, and the deflecting-surface described, with a raised metal seat adapted to fit said recess and having an interior section, *V*, all arranged substantially as and for the purpose described.

8. In a globe-valve having one metal and one compressible seat, the combination of the exterior wall of the valve, extended somewhat below the inner surface of the valve and beveled on its outer under corner, the side of the valve *x*, and the wall of the chamber with the wall *m*, the latter being extended above the surface of the seat and beveled on its upper inner corner, all arranged to center the raised metal seat on the compressible seat in the act of closing the valve, as described.

9. The combination of a valve-disk, having an annular recess filled or partly filled with compressible packing, with a raised seat provided with a contacting-surface completely covering the packing, and adapted, when shut into the recess, to completely fill the same, substantially as and for the purpose described.

GEORGE PIERCE.

Witnesses:

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