H. S. LANSDELL & J. S. LENG.

Valve.

No. 162,178. Patented April 20, 1875.

Fig: 1.

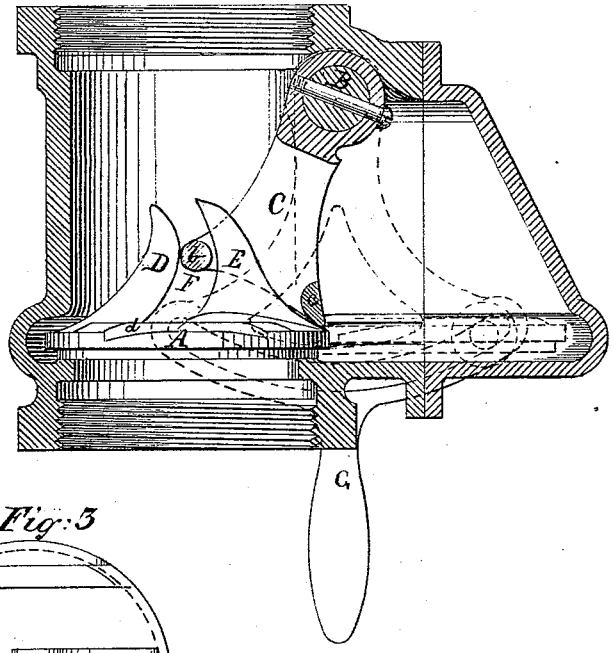


Fig: 3

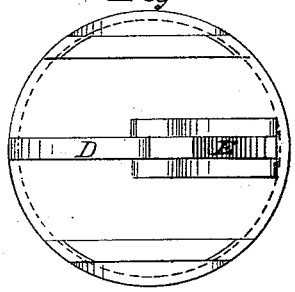


Fig: 2

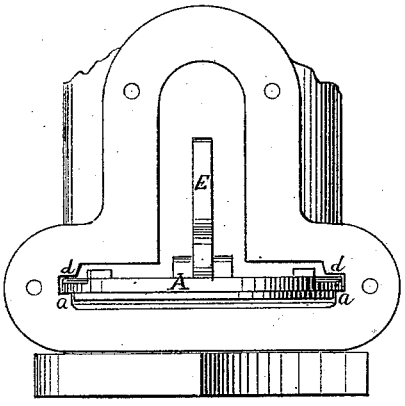
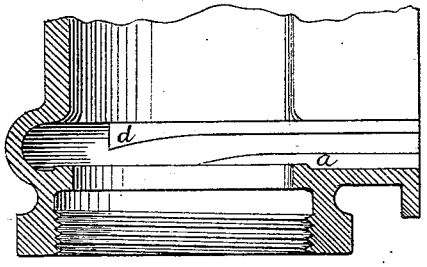


Fig: 4.



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UNITED STATES PATENT OFFICE.

HENRY S. LANSDELL AND JOHN S. LENG, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN VALVES.

Specification forming part of Letters Patent No. **162,178**, dated April 20, 1875; application filed December 29, 1874.

To all whom it may concern:

Be it known that we, HENRY S. LANSDELL and JOHN S. LENG, both of the city of Brooklyn, county of Kings and State of New York, have invented a new and useful Improvement in Valves, of which the following is a specification:

This invention relates to stop-valves arranged within an inclosing-chamber, whether used for regulating the flow of water or of other fluids. The objects sought are simplicity of construction, durability in wear, and ease and rapidity of operation.

The invention consists, first, in the combination, with the valve proper, of a rock-shaft, by means of which, through suitable connections, the valve is opened and closed as the shaft is rocked in the one direction or the other, such shaft being located within the chamber in which the valve moves; second, in the combination, with the rock-shaft by means of which the valve is opened and closed, of an arm, which strikes against the back of the valve when it has reached its lowest depression, and forces it home upon its seat; third, in the use of devices by means of which the face of the valve is kept from contact with the inner wall of the valve-chamber from the moment the valve begins to open, so that all wear upon the face of the valve by friction against the wall of the chamber is avoided.

The invention is fully illustrated in the accompanying drawing, in which Figure 1 is a sectional view of the valve-chamber, the valve being shown in elevation. Fig. 2 is a side elevation of the valve and the valve-case, the cap of the valve-case being removed. Fig. 3 is a plan view of the back of the valve. Fig. 4 is a sectional view of the valve-seat and the inclined ways which control the movement of the valve as it opens and closes.

In the drawing, A is the valve. B is the rock-shaft. C is the arm attached to the rock-shaft. D and E are the curved arms on the back of the valve A. F is the curved slot formed by the arms D and E. G is the lever which rocks the shaft B. *a a* are the inclined ways on which the valve moves as it opens and closes, and which prevent the face of the valve from contact with the walls of the chamber. *d d* are the ways which, by their inclination, direct the valve upon its seat when it approaches its lowest point of depression. *b* and *c* are the connecting parts at the lower end of the arm C, *b* being embraced by the curved arms D and E, and *c* being pressed firmly against the back of the valve A, to force it home and hold it upon its seat.

The rock-shaft is located within the valve-chamber, passing through the walls thereof, as shown, its bearings being secured from leakage by any of the ordinary methods. A transverse opening is cut entirely through the lower end of the arm C, except at the parts marked *b* and *c* in Fig. 1, to permit the insertion of the arm E into the opening and its free movement therein. The connecting parts at *b* and *c* may be shaped to conform to the curved arms D and E, with which they come in contact. The inclined ways *a a* (shown in Figs. 3 and 4) prevent the face of the valve from contact with the walls of the chamber. When the valve is being opened and closed, the inclination of the ways *a a* is such as to direct the valve slightly away from its seat from the moment its opening begins, and to keep it from contact with the walls of the chamber and the valve-seat till the moment it is forced to its seat by the pressure of the part *c* of the lower end of the arm C against the back of the valve. This construction is important, inasmuch as it prevents the friction and wear which usually takes place between the face of the valve and the walls of the chamber and valve-seat, and soon destroys the usefulness of the valve.

The rock-shaft B and its attachments are operated by the lever G, the valve A being moved in the same direction as the lever. The lever G may be fixed at any desired point of its movement by means of a set-screw acting against the lever in connection with the walls of the chamber. A graduated scale and index may be marked upon the lever and the corresponding wall of the chamber, to denote the different degrees of opening given to the valve.

Instead of operating the rock-shaft by means of a lever, any equivalent device may be employed, as a rack and pinion, &c.

By reference to Fig. 1, the operation of our valve will be seen to be as follows: The valve being firmly pressed to its seat by the action

of the part *c* of the arm C against the back of the valve, move the lever G toward the right. This will cause a partial revolution of the shaft B and a movement of the lower end of the arm C in the same direction with the lever G. The arm *b* will be brought against the curved edge of the arm E, this curved edge being preferably of such shape that when the arm *b* strikes against it it will have a tendency to move the valve slightly away from its seat, as well as in the direction the lever G moves. This movement away from the valve-seat is controlled and limited by the ways *a a*, and is important, as it entirely prevents the wear of the face of the valve. By the continued movement of the lever G toward the right the valve is moved outward, while the arm *b* moves freely upon the curved edge of the arm E. When the valve is fully opened the arm *c* will be lifted off from the curve of the arm E, and at some distance from the back of the valve. By reversing the direction of the lever G the arm *b* will be pressed against the curved edge of the arm D, and the valve will be moved upon the ways *a a* back to its first position. Just before the valve entirely covers the port the inclines *d d* direct that part of the valve which strikes against them forward upon its seat, and immediately thereafter the bar *c* of the arm C exerts its pressure upon the opposite edge of the sliding valve, forcing it home and holding it firmly in place.

Instead of constructing the valve-chest with the inclines *d d*, these may be omitted, in which case it will be necessary that the pressure from the arm C be exerted upon the valve at a central point.

The curve upon the edge of the valve-arm E, against which the bar *c* acts, is, by preference, the arc of a circle having a radius equal to the distance of bar *c* from the axis of the rock-shaft B; and it is so related to other parts that when the valve is in the position shown in Fig. 1 this curve shall be as if described from a center somewhat to the right of the axis of the rock-shaft. This construction insures the continued efficient action of the bar *c* upon the valve, even after the lower or left-hand edge of the valve may have become somewhat worn in use.

We do not propose to limit ourselves to the use of the lever-arm C here shown as the mode of bringing the rock-shaft to act upon the valve. The rock-shaft might be provided with the segment of a toothed wheel, the teeth of which should work in a rack formed on the back of the valve. This would move the valve forward and back, while a cam upon the toothed wheel would perform the function of the bar *c* in pressing the valve to its seat; also, when the slotted flange upon the back of the valve is used, the slot in which the arm of the rock-shaft works may be made straight instead of curved; but in that case the slot should, by preference, be made to occupy a position inclined to the plane of the valve, to facilitate the movement of the valve from its seat, as hereinbefore explained.

What is claimed as new is—

1. In combination with a sliding valve, a rock-shaft arranged within the valve-chamber, and operating both to open and close the valve, substantially as set forth.

2. In combination with the sliding valve, a cam or lever-arm, or the equivalent thereof, arranged upon the rock-shaft and operating in connection therewith, substantially as described, to force the valve to its seat.

3. The combination of the rock-shaft, arranged within the valve-chamber, the lever-arm attached to said shaft, and the slot in the back of the valve, in which the lever-arm moves in opening and closing the valve.

4. In combination with the lever-arm, the slot in the back of the sliding valve, when the same is curved or otherwise constructed, substantially as described, to aid in starting the valve away from its seat the moment it begins to open, substantially as and for the purpose set forth.

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