R. A. BOWEN.

VALVE.

APPLICATION FILED MAY 2, 1917.

1,276,482. Patented Aug. 20, 1918.

Fig. 1.

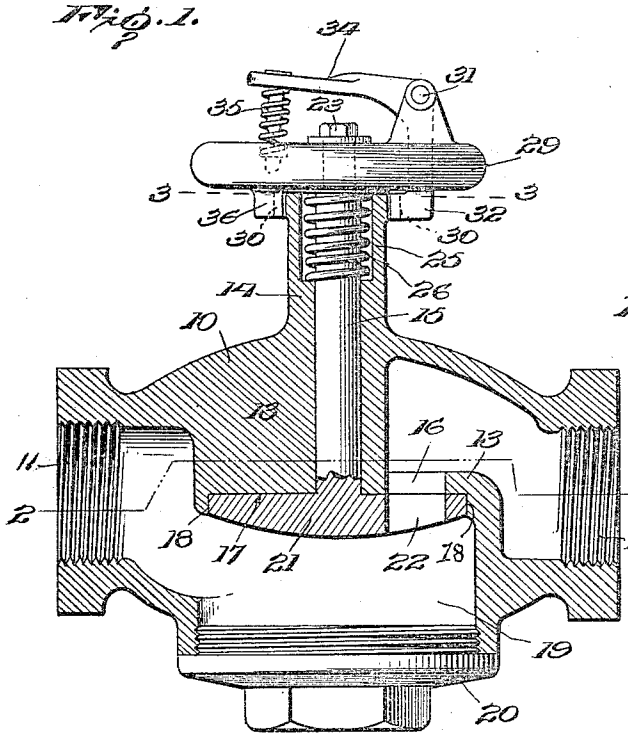


Fig. 3.

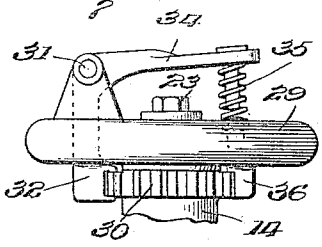


Fig. 4.

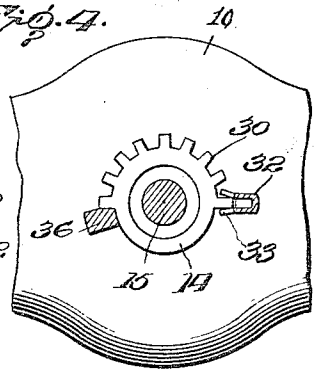


Fig. 2.

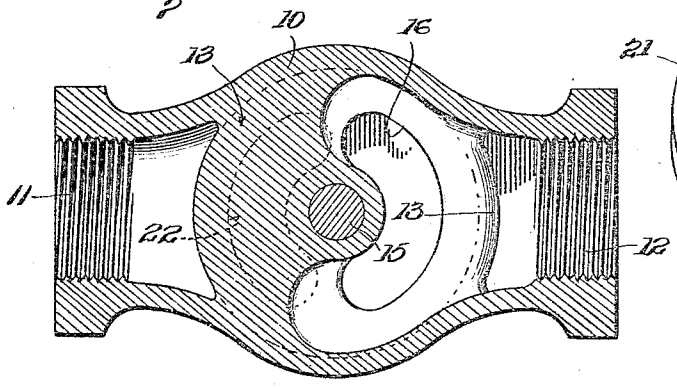
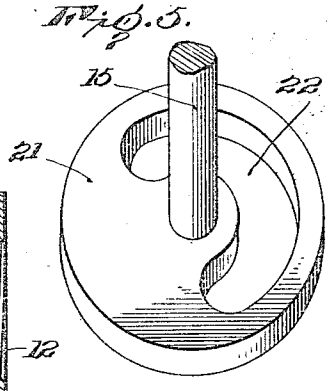


Fig. 5.



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UNITED STATES PATENT OFFICE.

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VALVE.

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Application filed May 2, 1917. Serial No. 166,019.

To all whom it may concern:

Be it known that I, ROBERT A. BOWEN, a citizen of the United States, residing at Spokane, in the county of Spokane and State of Washington, have invented certain new and useful Improvements in Valves, of which the following is a specification.

This invention relates to improvements in valves of the class employed for controlling the flow of steam or other gases or liquids, under pressure, and has for one of its objects to improve the construction and increase the efficiency and utility of devices of this character.

Another object of the invention is to provide a device of this character with the valve and passages so arranged that the flow therethrough is continuous and the liquid undivided and uninterrupted by the valves or other parts, thereby obviating any tendency to clog or be checked in its flow.

Another object of the invention is to provide a device of this character in which all of the interior parts are freely accessible for grinding the valve seats, or regrinding the seats in event of impairment or cutting.

With these and other objects in view, the invention consists in certain novel features of construction, as hereinafter shown and described and then specifically pointed out in the claims; and in the drawings illustrative of the preferred embodiment of the invention—

Figure 1 is a vertical sectional elevation of the improved device;

Fig. 2 is a section of the casing on the line 2—2 of Fig. 1;

Fig. 3 is an elevation of the upper portion of the device from the side opposite to that shown in Fig. 1;

Fig. 4 is a plan view of the valve casing with the valve stem and the stops in section on the line 3—3 of Fig. 1;

Fig. 5 is a detached perspective view of the valve.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The improved device comprises a hollow casing represented as a whole at 10 and with means for connecting an intake at one end and a discharge at the other end, the intake end being internally threaded as represented at 11, and the discharge end being internally threaded as represented at 12. The interior of the casing 10 is divided by a partition or diaphragm, indicated as a whole at 13, and is provided with a vertical extension or bearing 14 to receive the valve stem 15, and with a segmental port 16 concentric to the stem 15. The face of the partition or diaphragm 13 adjacent to the bearing 14 comprises the valve seat indicated at 17, the port 16 passing through the valve seat as shown. The seat 17 includes an annular portion 18 which merges into the seat, as shown in Fig. 1. The lower side of the casing 10 is formed with a relatively large opening 19 in which a threaded plug 20 engages to close the opening, the plug being provided with a wrench receiving projection. The opening 19 provides access to the seat 17—18 to permit the latter to be ground and likewise to enable the bearing 14 to be bored and turned true. The plug 20 likewise coacts with the opening 19 to form a drip chamber.

The valve is represented as a whole at 21 and is in disk-like form and provided with a segmental port 22 coacting with the port 16 to permit the passage of the gas or liquid, the stem 15 being preferably integral with the valve 21.

The upper face of the valve is ground to engage the seat 17 gas or water tight, while the margin of the valve is likewise ground to engage the portion 18 of the seat of the casing, the two ground surfaces coacting to render the valve gas and liquid tight.

The segmental ports 16—22 are so arranged that when the valve 21 is disposed in one position the ports 16—22 are in alinement or register, and when the valve is reversed in position the port 22 will engage

the solid unapertured portion of the seat 17 and thus cut off the flow.

The port 16 is less than one half of the area of the seat 17, so that when reversed in position, or turned one half a revolution, the port 22 will be entirely cut off by the solid or unperforated portion of the seat 17, and correspondingly cut off the flow of the gas or liquid. The valve 21 may likewise be so disposed as to partially cut off the flow by rotating the stem 15 a portion only of a revolution, thus the ports 16—22 may be open to any required extent to effectually control the flow.

The vertical extension or bearing 14 forms a guideway for the stem 15, and is cored to form a recess 25, within which a coiled spring 26 is disposed bearing at its lower end upon the shoulder formed by the recess 25.

Rigidly secured upon the upper end of the stem 15, preferably by a clamp nut 23, is a turning wheel 29. The wheel 29 bears flatly upon the extension 14, and the spring 26 engages the under-face of the hub of the wheel.

By this arrangement it will be obvious that the valve 21 is held by the force of the spring 26 in engagement with its seat 17, while the stem 15 may be rotated to control the flow through the valve by manipulating the wheel 29. Means is provided for locking the valve 21 in adjusted position, and consists of a plurality of radially disposed teeth 30 projecting from the extension 14 of the valve casing, the teeth extending about half way around the extension as shown in Fig. 4. Pivoted at 31 upon the hand wheel 29 is a bell crank lever comprising a lower arm 32 having a recess indicated at 33 to engage over the teeth 30 one at a time, while the other arm 34 of the bell crank lever extends over the outer face of the wheel 29 and is held yieldably in its upper position by a spring 35. The spring thus serving to maintain the portion 33 of the lever arm yieldably in engagement with one of the teeth 30. If the valve 21 is to be held in its full open position the lever 32—34 will be arranged to engage with the first tooth 30 at the right, and if the valve is to be locked in fully closed position the lever arm will be arranged with the portion 33 in engagement with the last tooth at the left, and by coupling the portion 33 of the lever with any one of the intermediate teeth, the valve may be held in any position partly open within the range of the teeth. Depending from the hand wheel 29 at a point diametrically opposite the portion 32 of the lever is a stop lug 36 which moves over the untoothed portion of the member 14 and is adapted to engage against the terminal teeth 30, and thus limit the movement of the member 15 and prevent the valve from being rotated except in one direction. By this arrangement it will be impossible to move the valve except in the proper direction.

By arranging the valve with the coacting ports 16—22 in registering position the flow of the gas or liquid is not checked by passing around short corners or short bends of the valve. The flow is thus unimpaired and the flowing liquid is not separated or divided, thus making the flow continuous. By the improved valve it is never required to rotate the stem more than half a revolution to dispose the valve either fully open or fully closed.

All parts of the interior of the casing are readily accessible for grinding the seat or regrinding the seat when worn.

The improved device may be constructed of any required size and of any required material and is adaptable to high or low pressure, and may be employed wherever a valve of this character is required.

Having thus described the invention, what is claimed as new is:

1. A valve including a casing having inlet and outlet ports and provided with an extension, the wall of which is formed with teeth extending partially around said extension, a valve having a stem seated in the extension, a turning member secured to the stem, a bell crank lever pivotally mounted on the turning member and having its short arm provided with a recess adapted to receive any one of the teeth, a spring interposed between the bell crank lever and the turning member, and a lug depending from the turning member and adapted to engage the end teeth for limiting the rotary movement of the turning member.

2. A valve including a casing having inlet and outlet ports and provided with an extension, the upper end of which is formed with an exterior segmental rack, a valve provided with a stem seated in the extension, the upper end of the extension being enlarged to form an interior recess, a turning device secured to the stem, a coiled spring seated in the recess and bearing against the turning member for yieldably holding the valve to its seat, spaced ears secured to the outer face of the turning member, a bell crank lever pivotally mounted between said ears and having its short arm depending below the turning member and provided with a recess adapted to receive any one of the teeth of the rack, a spring interposed between the long arm of the bell crank lever and the turning member, and a lug depending from the turning member and adapted to engage the end teeth of the rack for limiting the rotary movement of said turning member.

3. A casing provided with an extension, the outer portion of which is formed with teeth extending partially around the extension, a shaft seated in the extension, a turning member secured to the shaft, a bell crank lever pivotally mounted on the turning member and having its short arm provided with a recess adapted to receive any one of the teeth, means for normally holding the recessed end of the bell crank lever in engagement with the teeth, and a lug depending from the turning member and adapted to engage the end teeth for limiting the rotary movement of the turning member.

In testimony whereof I affix my signature.

ROBERT A. BOWEN. [L. S.]

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."