

J. S. GLENN.  
Balanced Rotary-Valve.

No. 200,388.

Patented Feb. 19, 1878.

Fig: 1.

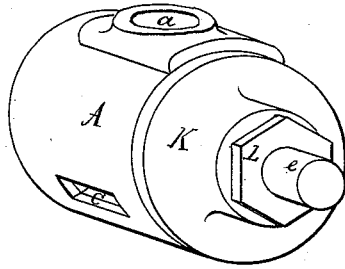


Fig: 2.

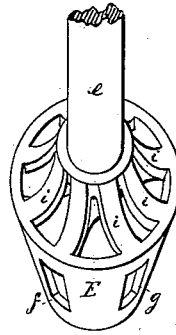


Fig: 3.

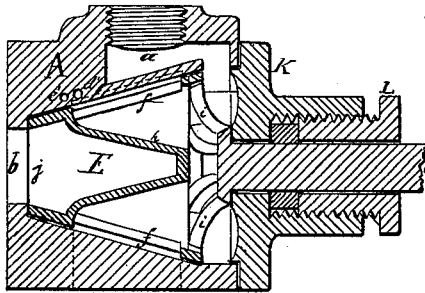


Fig: 4.

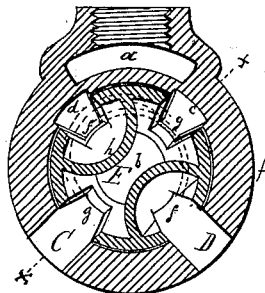


Fig: 5.

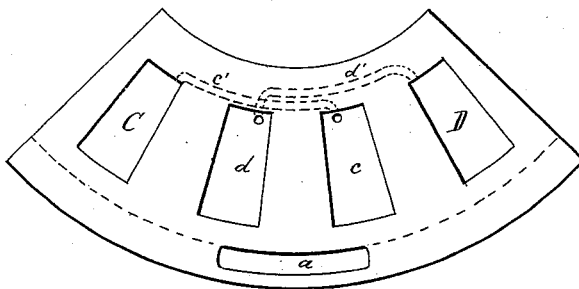
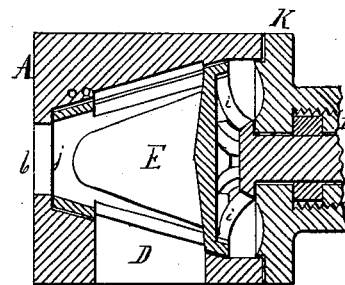


Fig: 6.



Witnesses  
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# UNITED STATES PATENT OFFICE.

JOHN S. GLENN, OF CHICAGO, ILLINOIS.

## IMPROVEMENT IN BALANCED ROTARY VALVES.

Specification forming part of Letters Patent No. **200,388**, dated February 19, 1878; application filed December 19, 1877.

*To all whom it may concern:*

Be it known that I, JOHN S. GLENN, of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Balanced Rotary Valve, of which the following is a full and exact description.

The nature of my invention relates to valves for steam or hydraulic engines having a rotating or oscillating motion; and my object is to so arrange a valve that the pressure is always counterbalanced from opposite sides, so that the same will move with less friction, and that its surfaces will wear off more even.

My invention consists in the peculiar construction of the valve and casing, as more fully hereinafter set forth.

In the drawing, Figure 1 is an exterior perspective view of the valve-casing. Fig. 2 is a similar view of the valve. Fig. 3 is a longitudinal vertical section of the valve and casing. Fig. 4 is a vertical cross-section of the same. Fig. 5 shows the interior surface of the valve-casing developed; and Fig. 6 is a section on line *x x* in Fig. 4.

A represents the valve-casing, being bored out conically and having steam entrance-port *a*, exhaust-port *b*, and the cylinder-ports C and D, and opposite to each of the cylinder-ports a cavity, *c* and *d*, of equal shape and size therewith. The cylinder-port C communicates with its opposite cavity *c* by a small flue, *c'*, and the cylinder-port D is similarly connected with the cavity *d* by a flue, *d'*, so that the steam or water entering either one of these ports will fill the opposite cavity and will attain the same density therein, so that the pressure from both opposite points will be the same.

E represents the valve, which is turned conically to make a tight fit with the conical bore in the casing, and has a stem or trunnion, *e*. This valve has four ports, two of which, *f f*, which are opposite to each other, communicate with the steam-entrance port *a*, and the other two, *g g*, also opposite to each other and right-angularly with the ports *f f*, communicate with the exhaust-port *b*. The U-shaped partition *h* is for separating the ports *f* and *g*.

The connection between the valve E and

its stem *e* consists of a series of small radial ribs, *i*, the open spaces between which permit the steam coming from port *a* to enter the valve.

The lower end *j* of the valve is open and forms a continuation of the exhaust-port *b*, the rim of the shell of the valve being fitted against a shoulder in the casing, for the purpose of preventing the conical face of the valve from wedging itself too tightly into the casing-bore.

By the size of diameter of the valve-stem *e* the over-pressure upon the stem end of the valve can be regulated, which should be but just enough to hold the valve in contact with its seat.

K is the cap or cover of the valve-casing, having a stuffing-box with a gland, L, for making a steam or air tight joint with the valve-stem.

As will be seen from the above description, this valve is perfectly balanced around its circumferential face, while the end pressure can be regulated by the size of the valve-stem. It will answer equally well for steam, air, or water, and its arrangement is also well adapted for a three-way cock. It is simple in construction, and offers equal advantages as a rotary or oscillating valve.

The valve-casing may be cast to the steam-cylinder, when the ports C and D will be synonymous with the ports in said cylinder.

What I claim as my invention is—

1. In a conical valve, E, adapted to receive steam through one end and exhaust it through the opposite end, the combination of the steam and exhaust ports *f f* and *g g* on the sides of the valve with the partition *h*, constructed substantially as described, so that the steam-ports connect exclusively with one end of the valve and the exhaust-ports with the other end.

2. The valve E, having stem *e*, ports *f* and *g*, partition *h*, and radial ribs *i*, all constructed, arranged, and operated substantially in the manner set forth.

3. The valve-casing A, having entrance-port *a* in its side and exit-port *b* in one end, and provided with the cylinder-ports C D, connected by passages with cavities of equal size diametrically opposite, in combination

with the conical valve E, having ports adapted to receive steam through one end and exhaust through the opposite end, substantially as and for the purpose set forth.

4. The casing A, having ports *a b* C and D, cavities *c* and *d*, flues *c'* and *d'*, cover K, and gland L, in combination with the valve E,

having stem *e*, ports *f f* and *g g*, partition *h*, and ribs *i*, all constructed, arranged, and operating substantially as herein set forth.

JOHN S. GLENN.

Witnesses:

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