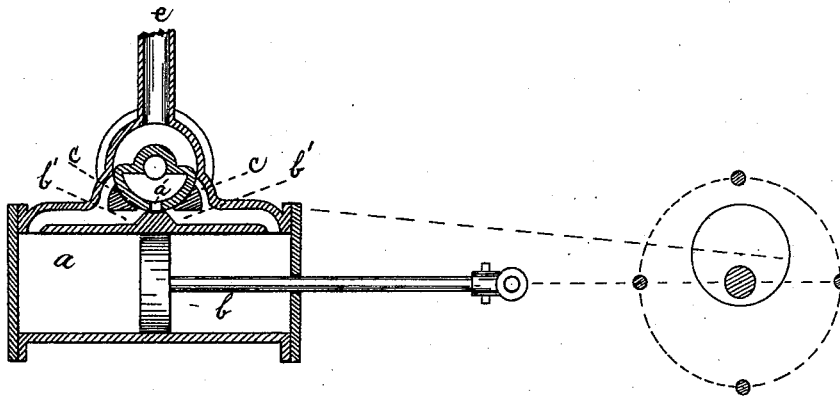


J. FAIRBURN.

BALANCED ROTARY-VALVES FOR STEAM-ENGINES.

No. 181,325.

Patented Aug. 22, 1876.



*Witnesses:*  
*Frank H. Jordan.*  
*N. G. Briggs*

*Inventor:*  
*John Fairburn*  
*per*  
*William Henry Clifford*  
*att'y.*

# UNITED STATES PATENT OFFICE.

JOHN FAIRBURN, OF UPTON, QUEBEC, CANADA.

## IMPROVEMENT IN BALANCED ROTARY VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **181,325**, dated August 22, 1876; application filed May 3, 1876.

*To all whom it may concern:*

Be it known that I, JOHN FAIRBURN, of Upton, in the county of Bagot, Province of Quebec, Canada, have invented certain new and useful Improvements in Balance-Valves for Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The drawing shows a sectional view of my invention.

The object of my invention is to provide a valve economical and useful, having all the advantages of any valve or valves in use, and being perfectly balanced in all its movements.

The valve is shown in the drawing in position relative to the cylinder *a*. *a'* shows a port or passage from the valve, cylindrical or semi-cylindrical in shape, placed transversely on any ordinary cylinder, and by any of the usual methods of moving an ordinary valve, and made to oscillate or partially revolve, alternately allowing the steam to pass to the opposite sides of the piston *b* by the steam-passages *b'*, said steam being made to exhaust by the return-passages *c* at a suitable time by every alternate movement of the valve.

It will be noticed that this valve has but one port placed in a central position on the lower side, working on a true face provided for the same, and, also, that the steam is admitted at one end of the valve. This avoids the external, or commonly called "back pressure," so detrimental in ordinary valves. It also obviates friction, wear and tear, and loss of power in giving motion to the valve.

*c* shows the exhaust-passages, so arranged

that the waste-steam passes over the back or top of the valve, and is carried away by a vertical pipe, *e*, or by any other suitable arrangement.

It will be observed that during the movement of the valve the steam will exert an upward pressure, due to the area of the port *a'*. The action of the exhaust-steam on the back of the valve counteracts this pressure, and gives an exact and true counter-balance, and makes the valve a perfect balance-valve. The entrance and exhaust passages are formed by the seat *d* and parts *e*. The parts *e* are important in preventing a large degree of wear on the seat *d*, and in insuring a uniformity of movement to the valve itself. They prevent any danger of the valve striking the angles formed at the points where the exhaust-passages enter the case of the valve.

I do not claim any particular mode of giving the requisite motion to the valve. The ordinary eccentric or any method can be employed.

Neither do I claim any particular method of introducing the steam to the inside of the valve, or any special mode of conveying away the exhaust-steam from the back of the same.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination and arrangement, with the valve, constructed and operating as described, and the cylinder, of the steam-passages *b'* and exhaust-passages *c*, the said passages being formed by the valve-seat *d* and parts *e*, as shown.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JOHN FAIRBURN.

Witnesses:

JAMES FOLEY,  
W. S. MURRAY.