2 Sheets--Sheet 1.

J. J. GRANT.
Steam-Valve.

No. 160,182

Patented Feb. 23, 1875.

Fig. 1.

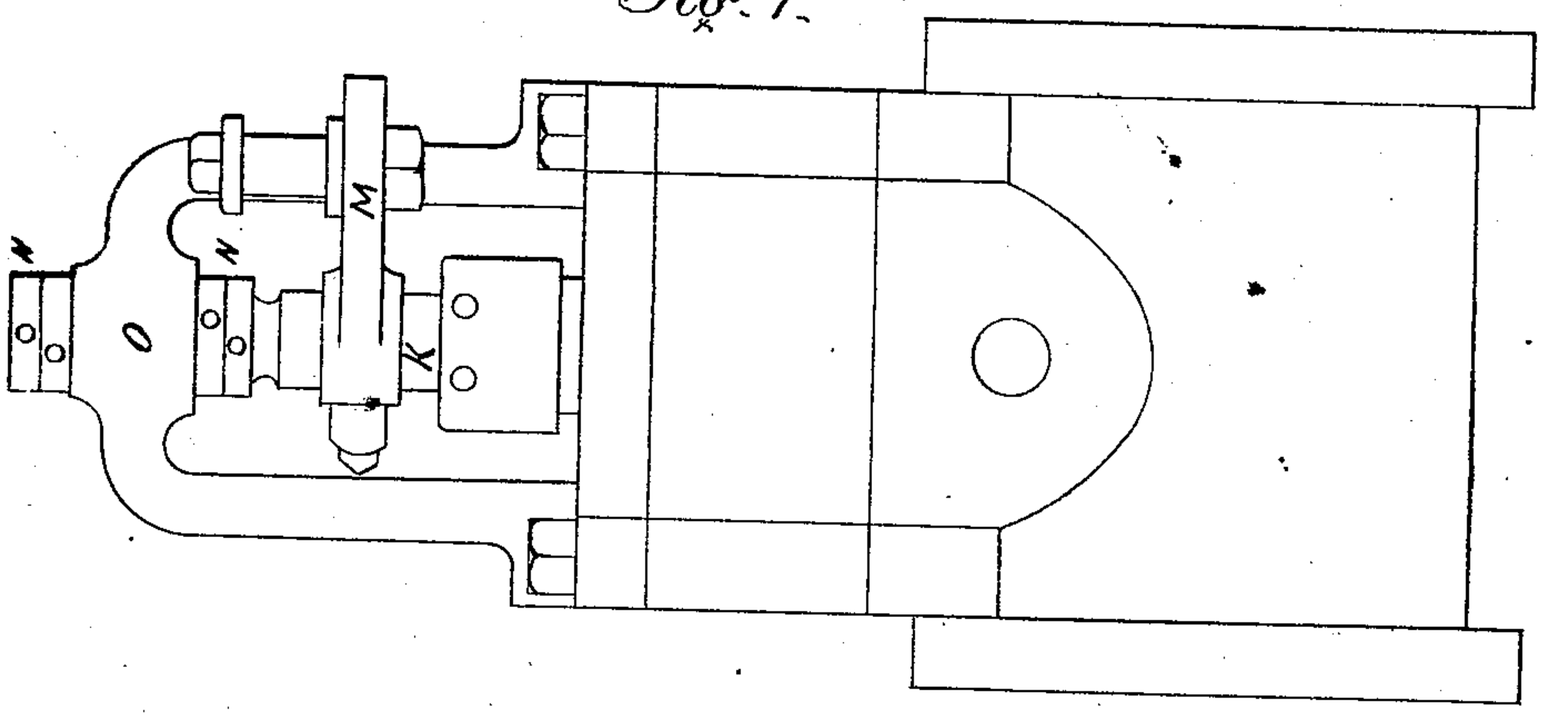


Fig. 2.

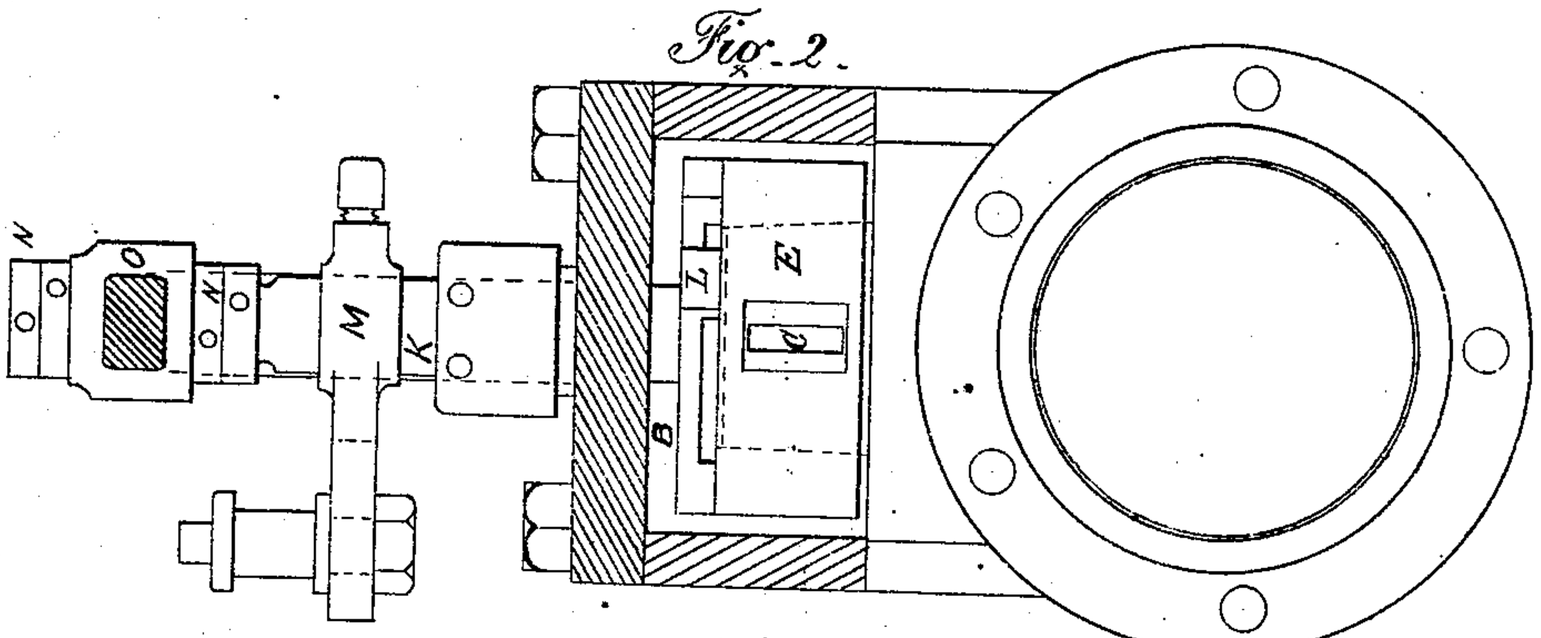
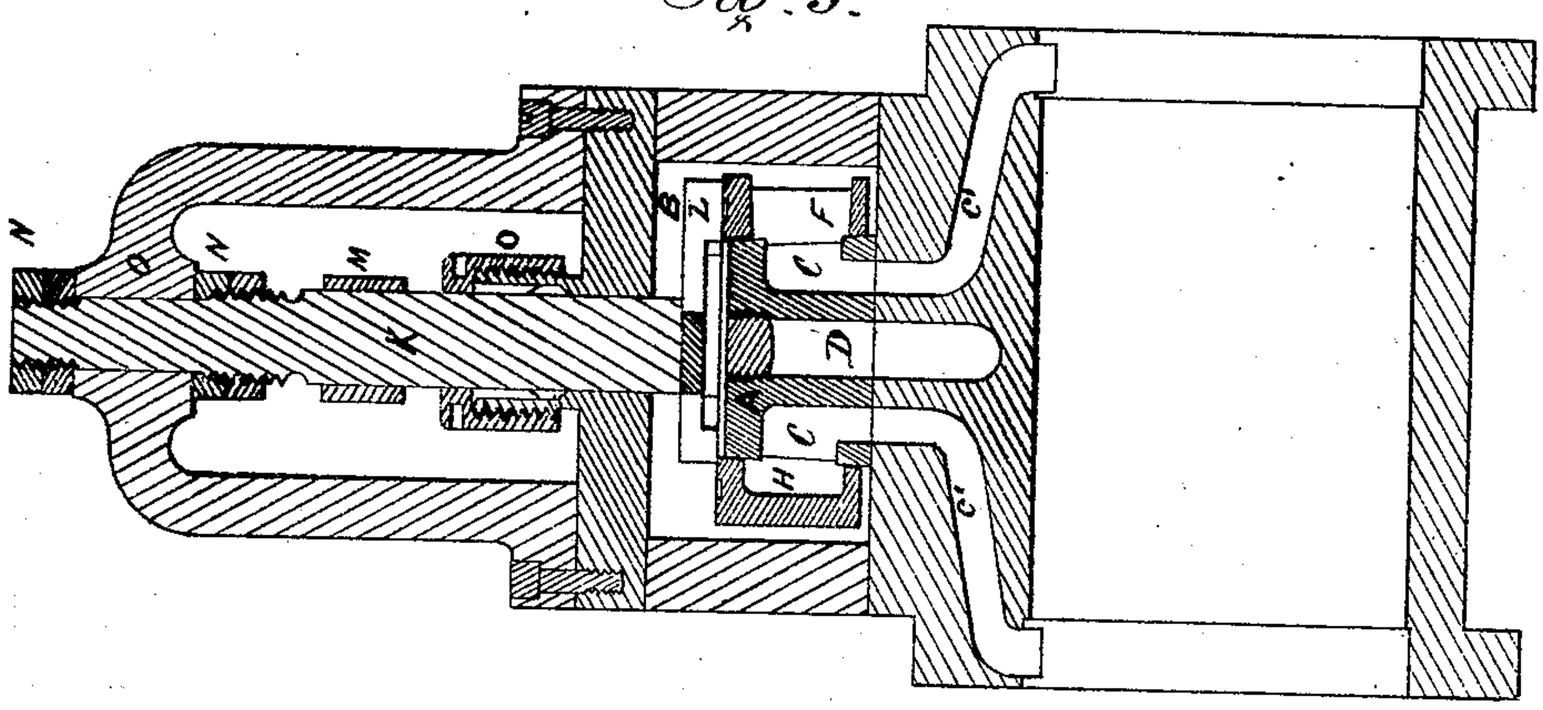


Fig. 3.



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2 Sheets--Sheet 2.

J. J. GRANT.
Steam-Valve.

No. 160,182

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Fig. 4.

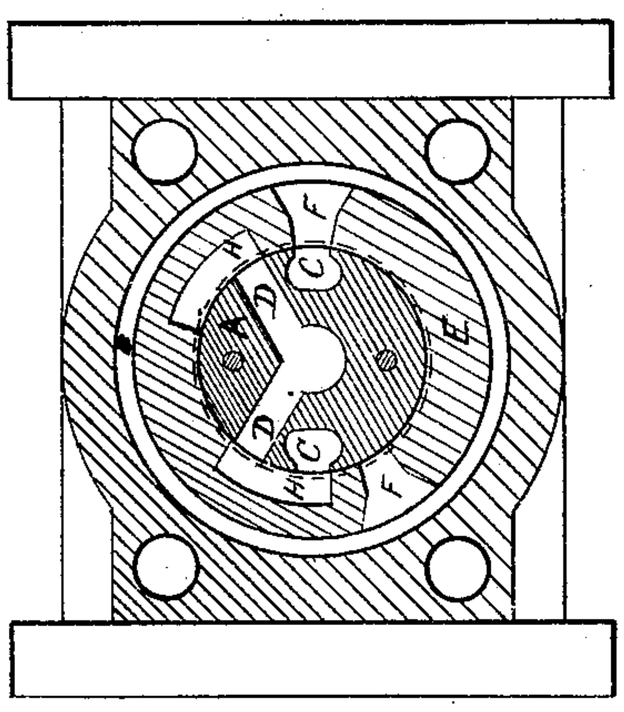


Fig. 5.

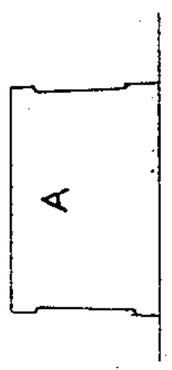
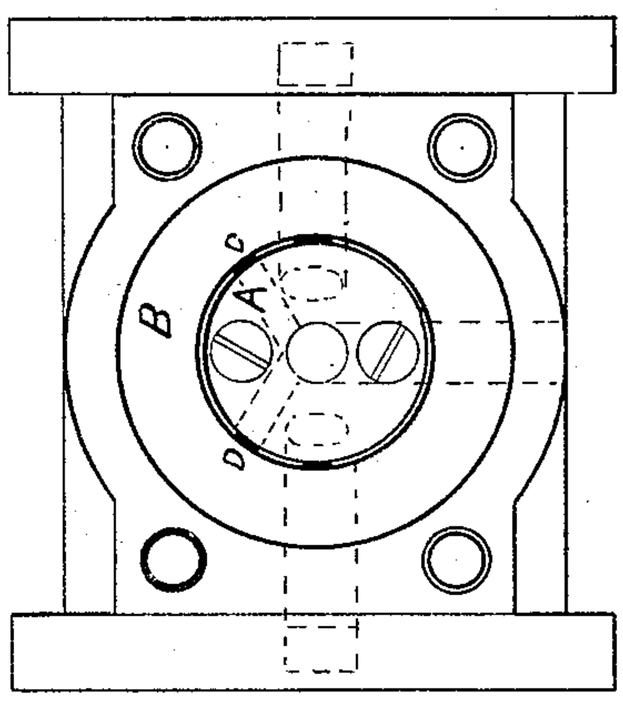


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN J. GRANT, OF GREENFIELD, MASSACHUSETTS, ASSIGNOR TO HIMSELF AND SOLON L. WILEY, OF SAME PLACE.

IMPROVEMENT IN STEAM-VALVES.

Specification forming part of Letters Patent No. **160,182**, dated February 23, 1875; application filed July 22, 1874.

To all whom it may concern:

Be it known that I, JOHN J. GRANT, of Greenfield, county of Franklin and State of Massachusetts, have invented certain Improvements in Steam-Valves.

The following description, taken in connection with the accompanying plate of drawings hereinafter referred to, forms a full and exact specification, wherein are set forth the nature and principles of the invention, by which the same may be distinguished from others of a similar class, together with such parts thereof as are claimed as new, and are desired to be secured by Letters Patent of the United States.

My invention relates to that class of valves which are employed for alternating the flow of steam to or from the ends of the cylinder in steam-engines; and the nature thereof consists in certain improvements in the details of the construction of the same, hereinafter described, whereby the steam is allowed to pass entirely around the slide, and the valve is perfectly balanced.

In the accompanying drawings, which illustrate my invention and form a part of the specification thereof, Figure 1 is a view of the exterior of a cylinder and steam-chest fitted with my improved valve. Fig. 2 is an end view, partially in section, illustrating the exterior parts of the slide. Fig. 3 is a vertical longitudinal section. Fig. 6 is a plan or top view of the slide-jacket, from which the slide has been removed. Fig. 5 is a view of the conical frustum. Fig. 4 is a horizontal section taken through the slide-jacket, illustrating the arrangement of steam-ports and exhaust-channel.

The slide-jacket B, into which the steam first enters, is provided with a conical frustum, A, in which are cut the openings which communicate with the passages leading to the cylinder and the exhaust-channel. The ports C, situated on opposite sides of the frustum, communicate with the passages *c'*, which open into the upper and lower ends of the cylinder, respectively, while the ports D connect with the exhaust-channel D', through which the steam can escape. These openings C and D are covered by the cylindrical slide B, which is provided with ports *b*, through which steam is admitted from the slide-jacket and cavities H, so arranged as to embrace the exhaust-passages D and ports C, communicating by means of the channel *c'* with the cylinder, so as to let the steam escape from the cylinder, while the port on the opposite side is left open for the ingress of steam to the cylinder.

For every ascent and descent of the piston in the cylinder a corresponding rotation of the slide is effected by means of apparatus connected with the moving parts of the engine, and the complete successive alternation of the steam is maintained without the expenditure of more power than is necessary to overcome the friction.

The interior surface of the cylindrical slide and the surface of the frustum upon which it rubs are made true and smooth, in order that they may be steam-tight. The slide is so fitted as to leave a space for the ingress of steam between it and the bottom of the slide-jacket, and is attached to the spindle K by the radial bars L, in such a manner as to allow the steam to pass entirely around it, as is clearly shown in Figs. 2 and 3, thereby causing the valve to be perfectly balanced.

The valve-stem K passes through a stuffing-box, S, and cylindrical aperture cut in the yoke O, and receives a reciprocating rotary motion from the arm *m*, which is connected to an eccentric or other suitable device on the main shaft. The said valve-stem is fitted with jam-nuts or collars N to the yoke O, in such a manner as to be vertically adjustable, so that when the slide becomes worn the jam-nuts can be slackened, and the said slide forced down to its seat, after which the stem may be secured in the desired position by retightening the nuts.

Having thus described my invention, I will state what I claim and desire to secure by Letters Patent in the following clause:

The conical frustum arranged within the valve-jacket, and provided with two ports,

opening into the cylinder, and two openings connecting with the exhaust-channel, in combination with the cylindrical slide, having two ports, through which steam is admitted, and cavities arranged to embrace the exhaust-passages and passages leading to the cylinder, as and for the purposes described.

In testimony that I claim the foregoing I have hereunto set my hand this 20th day of July, 1874.

JOHN J. GRANT.

Witnesses:

AUSTIN DE WOLF,

MARK H. FARNSWORTH.