

(No Model.)

2 Sheets—Sheet 1.

J. P. NORTHEY.
STEAM ACTUATED VALVE.

No. 274,647.

Patented Mar. 27, 1883.

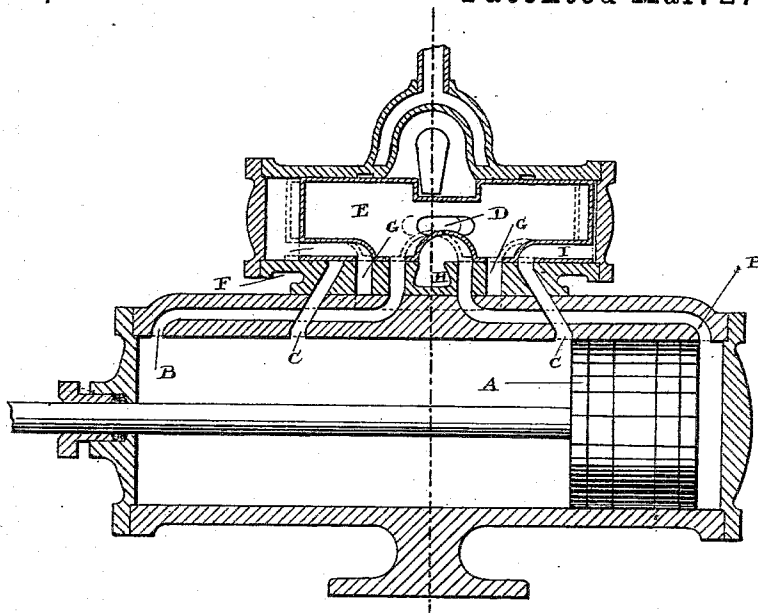


Fig. 1.

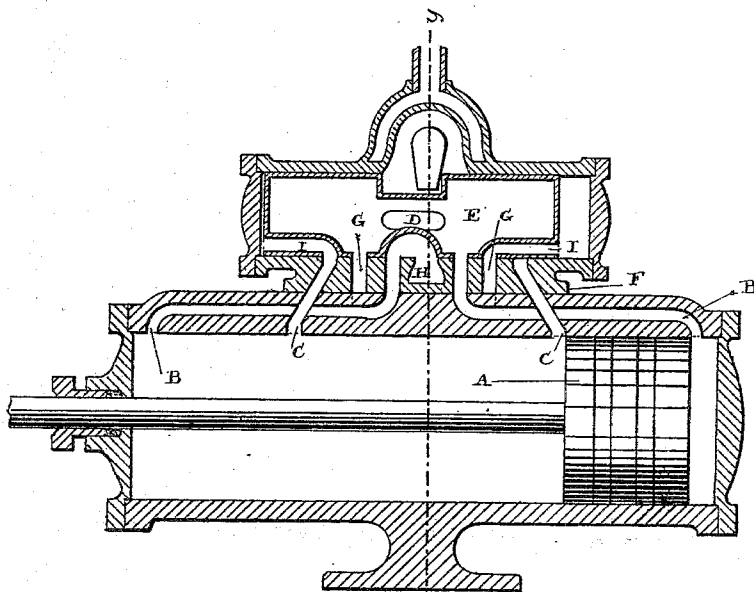


Fig. 2.

Witnesses.

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Inventor.

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by
Donald C. Ridout & Co.
Attys.

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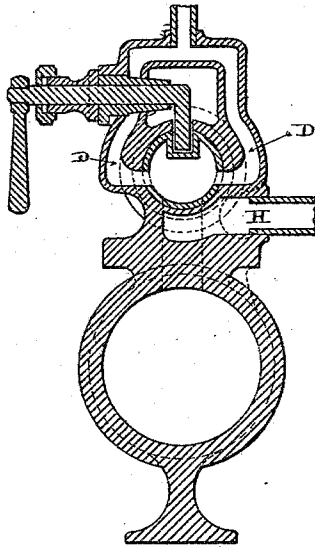


Fig. 3.

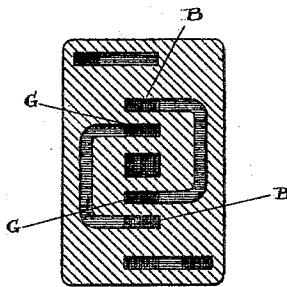


Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN P. NORTHEY, OF TORONTO, ONTARIO, CANADA.

STEAM-ACTUATED VALVE.

SPECIFICATION forming part of Letters Patent No. 274,647, dated March 27, 1883.

Application filed December 28, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN PELL NORTHEY, a subject of the Queen of Great Britain, residing at the city of Toronto, in the county of York, in the Province of Ontario, Dominion of Canada, have invented certain new and useful Improvements in Steam-Actuated Valves, of which the following is a specification.

The invention relates more particularly to improvements in steam-engines as applied to steam-pumps; and the object of the invention is to operate the main cylinder-valve by the steam it admits into the cylinder without the intervention of any mechanical contrivance.

It consists essentially in the peculiar arrangement of steam-ports connecting the interior of the steam-chest with the interior of the cylinder.

Figure 1 is a longitudinal section of a cylinder and steam-chest, showing the valve in the position it will appear while admitting the steam to propel the piston toward the end of the cylinder it is represented to be at. Fig. 2 is a longitudinal section, showing the valve as it will appear when admitting the steam into the opposite side of the piston. Fig. 3 is a cross-section through xy . Fig. 4 is a plan of the cylinder, showing the ports as they will appear when the steam-chest is removed.

In the drawings, A is the piston, and B the ordinary steam-ports extending from each end of the cylinder to the valve-face of its steam-chest.

Care auxiliary ports communicating between the interior of the cylinder and the interior of the steam-chest. These ports C are so constructed that they do not interfere or come in contact with the main ports B.

D is the main steam-port, leading from the throttle-valve into the interior of the valve E. The bottom F of the steam-chest has ports cut through it to communicate with the steam-ports B and C in the top of the cylinder, and has also short ports G cut through it, for the purpose hereinafter explained.

H is the ordinary exhaust-port to be formed in the bottom F, the exhaust-port in the valve E being also of the ordinary kind.

I is a steam-port formed in each end of the valve E, extending from its extreme end to such a point, through the bottom surface of the valve E, that when the mouth of the main steam-port, which communicates with the interior of the

valve E, shall be immediately opposite to the port G the mouth of the port I shall be immediately opposite to the mouth of the port C.

As shown in Fig. 1, the valve E is in position so as to admit the live steam from the interior of the valve in through the port B into the cylinder, so as to push the piston A toward the end it is shown at. When the piston A reaches the mouth of the port B on the right-hand side of this figure it has passed the mouth of the port C, thereby permitting the live steam to enter through the ports C and I into the steam-chest. The force of the steam so admitted forces the valve E toward the other end of the steam-chest. When it reaches the position it is shown in in dotted lines, Fig. 1, all the ports are closed; but as it continues to move by the expansion of the steam the port I on the right-hand end of the valve commences to open upon the port G, which communicates by a groove cut in the top surface of the cylinder (see Fig. 4) with the main port B on the left-hand end of the cylinder, thereby admitting the steam which is then behind the piston into the right-hand end of the steam-chest at the same time it commences to enter the left-hand end of the steam-chest through the ports C and I on the left-hand side of the figure.

It will thus be seen that by providing the short ports G, communicating with the main ports B, as described, an equilibrium of pressure on the valve E is secured thereby permitting it to complete the balance of its stroke by the momentum it attained by the pressure of the steam first admitted behind it. Thus the relative position of the ports in the valve to those in the cylinder is changed to the position shown in Fig. 2. Immediately the valve is so changed steam is admitted through the port B on the right-hand side of the figure into the cylinder on the opposite side of the piston, and at the same time the port B on the left-hand side of the figure is put into communication with the exhaust-port H. As the piston A continues to travel toward the left-hand end of the cylinder the port C on the left-hand side is passed, and the live steam, being thus admitted through it, causes the valve E to travel back, and the operation is repeated, as before described.

It will thus be seen that by the arrangement of ports described regular reciprocation of the piston is secured without any mechanism for

operating the valve, and, in fact, with only two working parts—viz., the piston and the main valve.

What I claim as my invention is—

5 1. The combination, with the hollow valve E, having ports D I and an opening coinciding in area with a port, G, of the ports C, B, and G, the latter communicating with said ports B, substantially as described.

2. In a steam-cylinder, the combination, with 10 the ports B and C, located as described, of the short ports G, arranged to communicate with the ports B, substantially as and for the purpose specified.

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Witnesses:

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