

J. F. Hamilton,

Piston Valve.

No 111,341.

Patented Jan. 31. 1871.

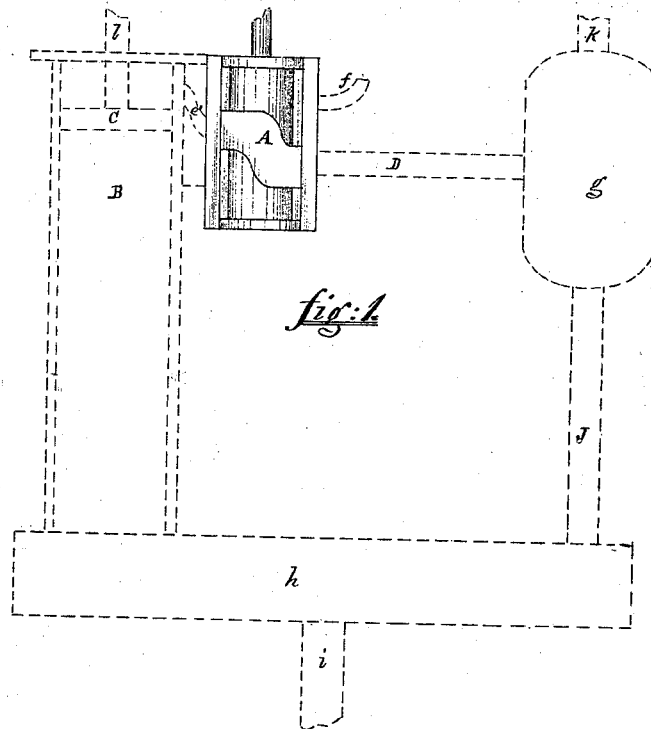


fig. 1

fig. 2.

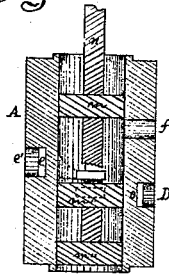


fig. 3.

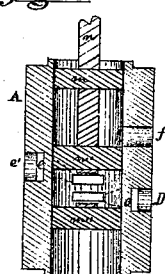


fig. 4.

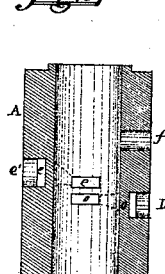


fig. 5.



Witnesses.

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IMPROVEMENT IN VALVES FOR STEAM-PUMPS.

Specification forming part of Letters Patent No. **111,341**, dated January 31, 1871.

To all whom it may concern:

Be it known that I, JOSEPH F. HAMILTON, of Alliance, Stark county, and State of Ohio, have invented a new and useful Improvement in Valves for Steam-Pumps for Water, Oil, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

The nature of my invention consists in so constructing a valve for a steam-pump that it shall be provided with three or more piston-heads on a single piston-rod, and the chamber of the valve provided with two or more steam-supply ports and two or more exhaust-openings, arranged opposite to each other, and with relation to the piston-rod and its heads, so that the steam in escaping from the valve shall exert its force from the center of the piston-heads toward their circumference.

To enable others skilled in the art to make and use my invention, I will proceed to describe more fully its construction and operation.

In the accompanying drawing, which forms part of my specification, Figure 1 represents a side view of my improvements in valve, and also represents its arrangement and relation to the several parts of the steam-pump. Fig. 2 is a vertical and central section of the valve-chamber, piston-rod, and heads, representing the position of the piston-heads when the valve is supplying the pump-chamber with steam. Fig. 3 is a vertical and central section of the valve-chamber, piston-rod, and heads, representing the position of the piston-heads when the valve is exhausting steam from the pump-chamber into the condenser. Fig. 4 is a vertical and central section of the valve-chamber, and represents the arrangement of the openings in each half of the valve-chamber. Fig. 5 is a side view of the piston-rod and the arrangement of piston-heads upon it.

In the accompanying drawing, the dotted lines marked B represent the pump-chamber. C represents its piston. D represents, in dotted lines, the exhaust-pipe which connects the valve A with the condenser, which is also represented in dotted lines, and marked g. The condenser g is connected to the bed-plate h of the pump by the pipe J. To the bed-plate h is attached the suction-pipe

i, and to the upper end of the condenser is attached the discharge-pipe K. The pipe f, which connects the valve A with the steam-boiler, should be provided with a suitable valve for regulating the flow of the steam from the boiler to the valve-chest A.

All the parts of the pump represented by dotted lines are of ordinary construction.

My invention is confined to the valve-chest A. I will therefore proceed to describe it.

The valve-chest A is provided with two steam-supply ports, e, (it may have more,) one on each side of the valve-chamber, which communicate with the pump-chamber B through the medium of the way or passage e'. (Indicated by dotted lines in Fig. 1.) The chamber is also provided with two exhaust-openings, o, one on each side of the chamber. The valve-chest A is also provided with a piston-rod, n, on which are arranged three piston-heads, m m' m'', arranged at unequal distances apart, and fitted to the bore of the chamber. The space between the piston-heads m and m' maintains constantly the pressure of steam in the steam-boiler, and the space between the piston-heads m' and m'' is for the purpose of forming the vacuum or exhaust.

The piston-rod n of the valve-chest A is connected with the piston-rod l of the pump B by means of suitable operating-gear, and the upward movement of the pump-piston is effected by means of a weight or other device, which arrangement for operating the piston of both pump and valve is well known in this class of steam-pumps.

As the construction and arrangement of the valve-chest A, and the relation it bears to the pump B, will be readily understood by the skillful mechanic, I will therefore proceed to describe the operation of the valve with relation to the pump and the parts connected therewith.

When the piston of the valve-chest A is in the position represented in Fig. 2, steam will enter the supply-port e of the valve A, and will pass through the way or passage e' into the pump-chamber B, so as to force down the piston C to the end of its stroke. At this point the piston of valve-chest A should be in the position represented in Fig. 3, which will allow the steam in pump-chamber B, after performing its office, to escape or exhaust

through the way or passage *e'*, and through the steam-ports *e* into the space between the piston-heads *m'* and *m''*, from which it will pass out through the exhaust-openings *o* into the exhaust-pipe D, and through it into the condenser *g*. By the time steam is exhausted from the pump-chamber B its piston C should be in the position represented in Fig. 1, and the piston of the valve-chest A should be in the position represented in Fig. 2, which positions of the pistons of pump and valve are proper for the pump receiving steam, and the valve for supplying it to the pump.

The hereinbefore-described arrangements of steam-ports and exhaust-openings, in combination with the single piston-rod, provided with three piston-heads, arranged at unequal distance apart, and adapted to the arrange-

ment of the said ports and openings, and forming the steam-supply chamber and exhaust-chambers in the valve A, are the main points of my invention.

Having thus described the construction, arrangement, and operation of my improvement, what I claim as of my invention is—

The valve-chest A, provided with two or more steam-supply ports and two or more exhaust-openings, arranged opposite each other, in combination with the piston-rod *n*, provided with three piston-heads, arranged at unequal distances apart, substantially as herein described and set forth.

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Witnesses:

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