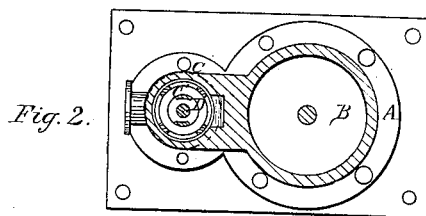
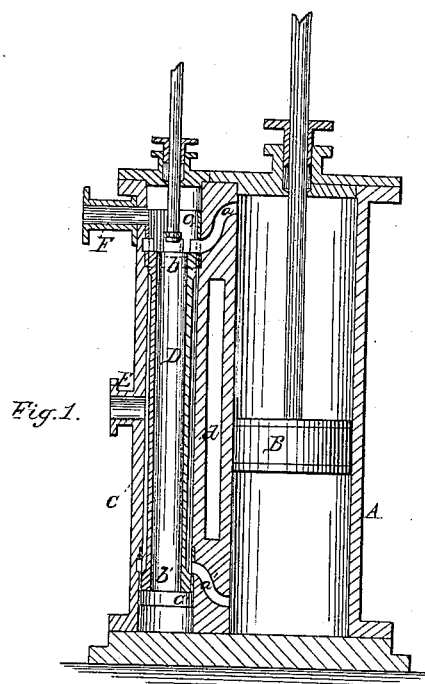


M. P. Mack,
Steam Balanced Valve.
No 53,314. Patented Mar. 20, 1866.



Witnesses:
J. M. B. Carington
Wm. Frewin

Inventor:
M. P. Mack
Per Munnell
Att'y

UNITED STATES PATENT OFFICE.

M. P. MACK, OF CANANDAIGUA, NEW YORK.

IMPROVEMENT IN PISTON-VALVES.

Specification forming part of Letters Patent No. 53,314, dated March 20, 1866.

To all whom it may concern:

Be it known that I, M. P. MACK, of Canandaigua, in the county of Ontario and State of New York, have invented a new and Improved Steam-Valve; 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 make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents a longitudinal central section of this invention. Fig. 2 is a transverse section of the same.

Similar letters of reference indicate like parts.

This invention relates to a steam-valve which is composed of a tubular double piston fitted into a tubular chamber, from which two channels lead one to each end of the steam-cylinder. These channels are protected by bridges to prevent the pistons from catching in the same, and the steam is supplied through a pipe leading into the valve-chamber near one end, and it passes through the tubular valve to reach the opposite end of the cylinder. The exhaust-pipe emanates from the middle of the valve-chamber, and the steam from either end of the cylinder exhausts through the annular space left in the valve-chamber between the two pistons or heads of the valve in such a manner that a valve is obtained which is perfectly balanced, and which works with comparatively little friction or loss of power.

A represents the steam-cylinder, into which is fitted the piston B of any suitable construction. Steam is admitted alternately to the opposite ends of said cylinder through the ports *a a'*, which lead to the valve-chamber C, as shown in Fig. 1 of the drawings. This valve-chamber is bored out to receive the heads *b b'* of the tubular double piston-valve D, and it is provided with two seats, *c c'*, perforated with openings which lead to annular recesses in the valve-chamber, said recesses being made to communicate with the ports *a a'*.

The openings in the seats are protected by bridges to prevent the heads *b b'* from catching in the same, and the seats *c c'* may be so arranged that they can be withdrawn from the valve-chamber and renewed whenever it may be desirable.

An annular space, *d*, is left between the two heads *b b'* of the valve and the inner wall of the valve-chamber, and through this annular space the steam which exhausts from the cylinder A reaches the exhaust-pipe E. F is the steam-supply pipe.

The operation is as follows: In the position shown in Fig. 1 the valve admits steam to the cylinder through the port *a* and the steam exhausts through the port *a'*. The steam, rushing in through the steam-pipe F, passes through the tubular valve D, so that the pressure on both ends of said valve is perfectly balanced. When the valve changes so that the head *b* comes above the port *a*, or between said port and the steam-pipe, the steam passes from the steam-pipe through the tubular valve and through the port *a'* in the cylinder, and the exhaust takes place through the port *a'*, annular space *d*, and pipe E. In either case the valve floats in the steam, and it takes no more power to move the same under a head of steam of a hundred or more pounds to the square inch than it does in the open atmosphere.

By the bridges which cover the openings in the seats the valve is prevented to catch, and it requires but little attention to keep the pistons or heads of the valves tight.

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

The tubular valve D, with two heads, *b b'*, in combination with the seats *c c'* in the valve-chamber ports *a a'*, leading to the cylinder A, and with the steam and exhaust pipe, all constructed and operating substantially as and for the purpose described.

M. P. MACK.

Witnesses:

J. H. METCALF,
CHARLES JONES.