

(No Model.)

2 Sheets—Sheet 1.

T. G. LANEY.
STEAM ACTUATED VALVE.

No. 485,046.

Patented Oct. 25, 1892.

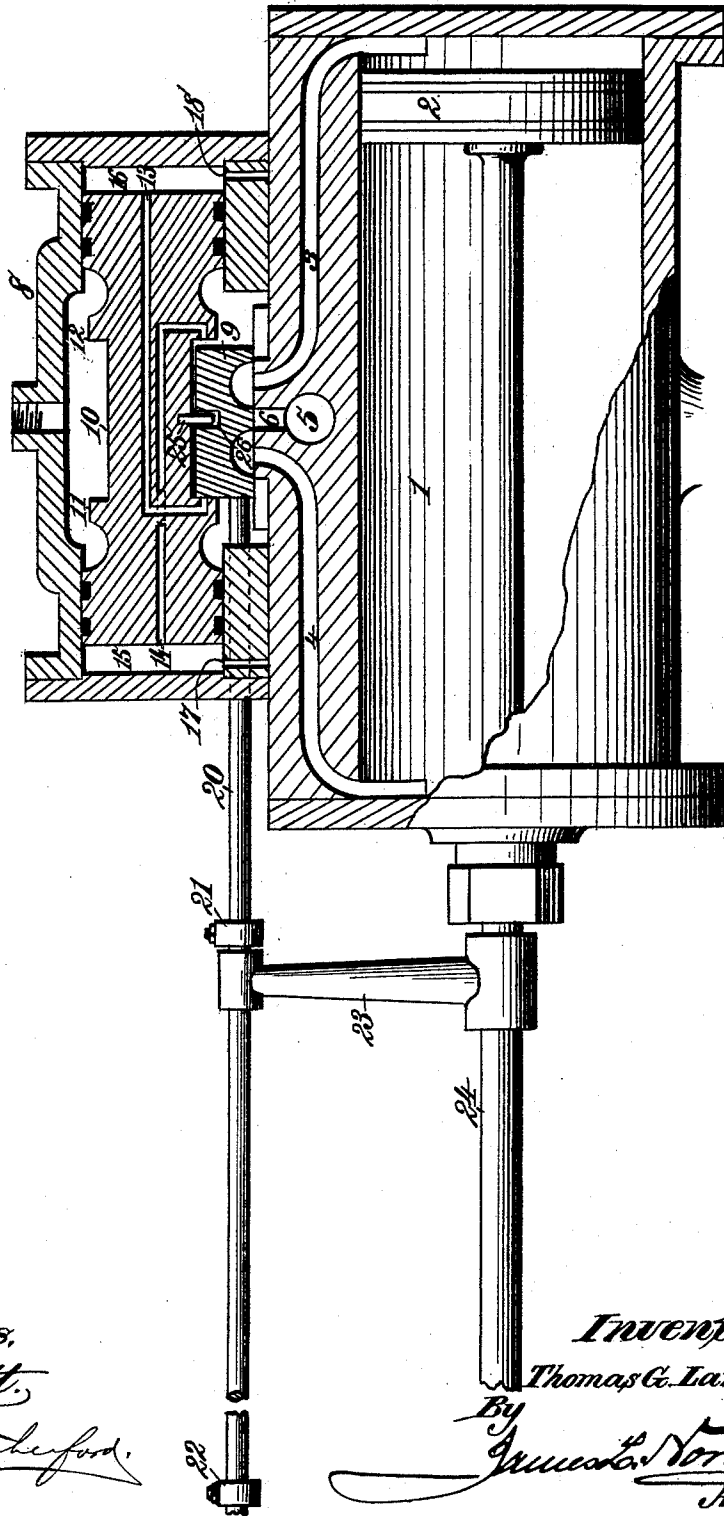


Fig. 1.

Witnesses,
Robert Smith,
J. A. Hutchinsford.

Inventor:
Thomas G. Laney,
By
James H. Norris,
Atty.

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Fig. 2.

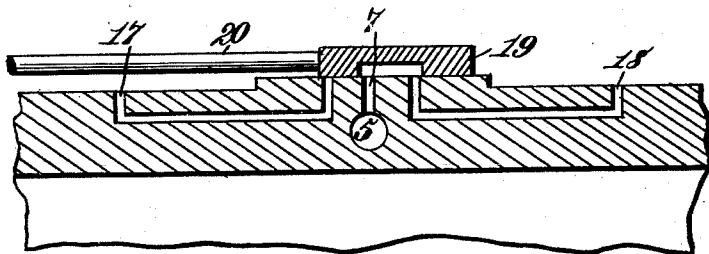


Fig. 3.

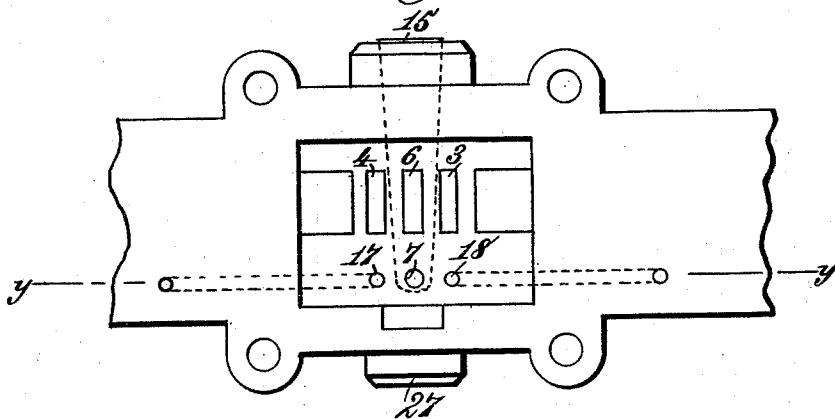
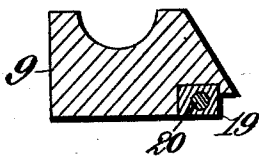


Fig. 4.



Witnesses:
Robert G. Smith
J. A. Rutherford

Inventor:
Thomas G. Laney
 By *James L. Norris*
 Atty.

UNITED STATES PATENT OFFICE.

THOMAS G. LANEY, OF LIMA, OHIO.

STEAM-ACTUATED VALVE.

SPECIFICATION forming part of Letters Patent No. 485,046, dated October 25, 1892.

Application filed July 7, 1892. Serial No. 439,263. (No model.)

To all whom it may concern:

Be it known that I, THOMAS G. LANEY, a citizen of Great Britain, residing at Lima, in the county of Allen and State of Ohio, have invented new and useful Improvements in Steam-Actuated Valves for Steam-Pumps, of which the following is a specification.

This invention relates to an improved valve-motion for steam-pumps and steam-engines; and it consists in the peculiarities of construction and novel combinations of devices, as hereinafter more particularly described and claimed.

In the annexed drawings, illustrating the invention, Figure 1 is a vertical longitudinal section through the valves, steam-chest, and cylinder on the line *xx* of Fig. 3. Fig. 2 is a vertical longitudinal section of a portion of the cylinder and the exhaust-valve through the line *yy* of Fig. 3. Fig. 3 is a plan view showing the main steam-ports to cylinder and the exhaust-ports to valve-piston. Fig. 4 is a vertical cross-section of the main valve and exhaust-valve.

Referring to the drawings, the numeral 1 designates the steam-cylinder of a pump or engine, and 2 the piston therein. In the cylinder wall or shell are ports 3 and 4, leading to opposite ends of the cylinder, and through which steam is alternately admitted and exhausted. A main exhaust-passage 5 is formed horizontally in the cylinder-wall between the outer ends of the cylinder-ports 3 and 4 and communicates through ports 6 and 7 with the steam-chest 8, to and from which the ports 3 and 4 also lead. The cylinder-ports 3, 4, and 6 are controlled by a main slide-valve 9, actuated by a double-ended valve-piston 10, located in the steam-chest. The upper side of the main slide-valve 9 is preferably concaved, as shown in Fig. 4, to receive the main body or central portion of the valve-piston 10, as shown in Fig. 1.

On the valve-piston 10 are collars or annular shoulders 11 and 12, arranged at opposite ends of the main slide-valve 9 and at such distance apart as to afford sufficient play to said valve, so that there will always be a space between one or the other of its ends and the adjacent collar. In these collars 11 and 12 of the valve-piston 10 are formed steam-admission ports 13 and 14, that are extended through the valve-piston for the purpose of

alternately admitting steam to the spaces or chambers 15 and 16 at the opposite ends of the steam-chest. The steam-admission ports 13 and 14 may be arranged to cross by each other within the body of the valve-piston 10, as shown.

From the spaces or chambers 15 and 16 at the ends of the steam-chest 8 are extended exhaust ports or passages 17 and 18, that communicate with a chambered exhaust-valve 19, by which said ports or passages 17 and 18 are alternately put in communication with the port or passage 7, leading into the main exhaust. The exhaust-valve 19 works in a groove or recess formed in the under side of the main slide-valve 9 and is provided with a valve-rod 20, having thereon collars 21 and 22, through which said valve is actuated by an arm 23 on the piston-rod 24 of the main piston.

To prevent the valve-piston 10 from turning on its axis, thereby throwing the ports 13 and 14 off from the end faces of the main slide-valve 9, and thus admitting steam through both of said ports at once, a pin 25 may be secured to the under side of the valve-piston and be arranged to engage loosely in a corresponding recess 26, formed in the upper face of the main slide-valve.

The operation of this valve-gear will be readily understood. The main piston 2 is actuated by steam admitted to the cylinder 1 through either of the ports 3 or 4 from a steam-inlet 27, communicating with the steam-chest. When the main piston 2 has arrived, say, at the right-hand end of the cylinder, as shown in Fig. 1, and the arm 23 on the piston-rod has struck the collar 21 on the valve-rod 20, thereby moving the exhaust-valve 19 into the position shown in Fig. 2, the space 16 will be put in communication through the port or passage 18 with the port 7, that leads into the main exhaust 5, and thus the pressure in said space 16 and passage 18 will be relieved, so as to enable the valve-piston 10 to move slightly to the right. The collar or shoulder 11 on the valve-piston 10 being thus brought closely against the adjacent left-hand end of the main slide-valve 9, the port 13 will be closed and the port 14 opened for admission of steam through the space left between the right-hand end of the valve 9 and the collar or shoulder 12, and steam will therefore pass through said

port 14 into the space 15 at the left-hand end of the steam-chest, thereby moving the valve-piston 10 and main slide-valve 9 farther to the right and admitting steam under said valve and through the port 3 to the right-hand end of the cylinder 1 to actuate the piston 2 in the opposite direction. When the main piston 2 arrives at the left-hand end of the cylinder 1, the arm 23 comes in contact with the collar 22 on the valve-rod 20, thereby moving the exhaust-valve 19 to the left, so that the operations above described will be repeated in the opposite direction by the passage of steam through the port 13 into the space 16 and through the port 4 into the main cylinder.

It will be observed that the location of the ports 17 and 18 with reference to the opposite ends of the steam-chest is such as to allow the valve-piston 10 to alternately cover them, thereby trapping steam between the piston and steam-chest head or end, so as to form a cushion for said piston.

It is obvious that this valve and valve-gear are adapted for use in connection with various forms of gas, air, or steam engines or pumps. If preferred, the said piston may be arranged for use with a single main valve and a double-exhaust valve.

What I claim as my invention is—

1. The combination, with a steam-cylinder and its piston having a piston-rod provided with an arm, of a steam-chest having cylinder-ports controlled by a main slide-valve and exhaust-ports controlled by an exhaust-valve having a valve-rod provided with collars arranged to be alternately struck by the arm on the main piston-rod, a valve-piston arranged in the steam-chest and having collars or shoulders to engage and actuate the main slide-valve and provided with steam-admission ports that lead through said valve-

piston to its opposite ends, and a pin that is secured to the valve-piston and loosely engaged with the main slide-valve to prevent the valve-piston from turning on its axis, substantially as described.

2. The combination of the steam-cylinder 1, having ports 3 and 4, the steam-chest 8, having ports 17 and 18, the main exhaust-port 5, having connecting ports or passages 6 and 7, the main slide-valve 9 for controlling the cylinder-ports, the exhaust-valve 19 for controlling the ports 17 and 18, means for actuating said exhaust-valve from the main piston, the valve-piston 10, having collars or shoulders 11 and 12 to actuate the main slide-valve and provided with steam-admission ports 13 and 14, that lead through said valve-piston to opposite ends of the steam-chest, said ports being controlled by contact of said shoulders or collars with the opposite ends of the main slide-valve, and a pin 25 for preventing said piston-valve from turning on its axis, substantially as described.

3. The combination of the cylinder 1, having ports 3 and 4, the piston 2, having a piston-rod provided with an arm 23, the steam-chest 8, having ports 17 and 18, the main exhaust-port 5, the main slide-valve 9, the valve-piston 10, provided with shoulders 11 and 12 and ports 13 and 14, the exhaust-valve 19, having a valve-rod 20, provided with collars 21 and 22, and the pin 25, connecting the main slide-valve and valve-piston, substantially as described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

THOMAS G. LANEY. [L. s.]

Witnesses:

W. T. LEMAN,
L. B. CHESEBRÓ.