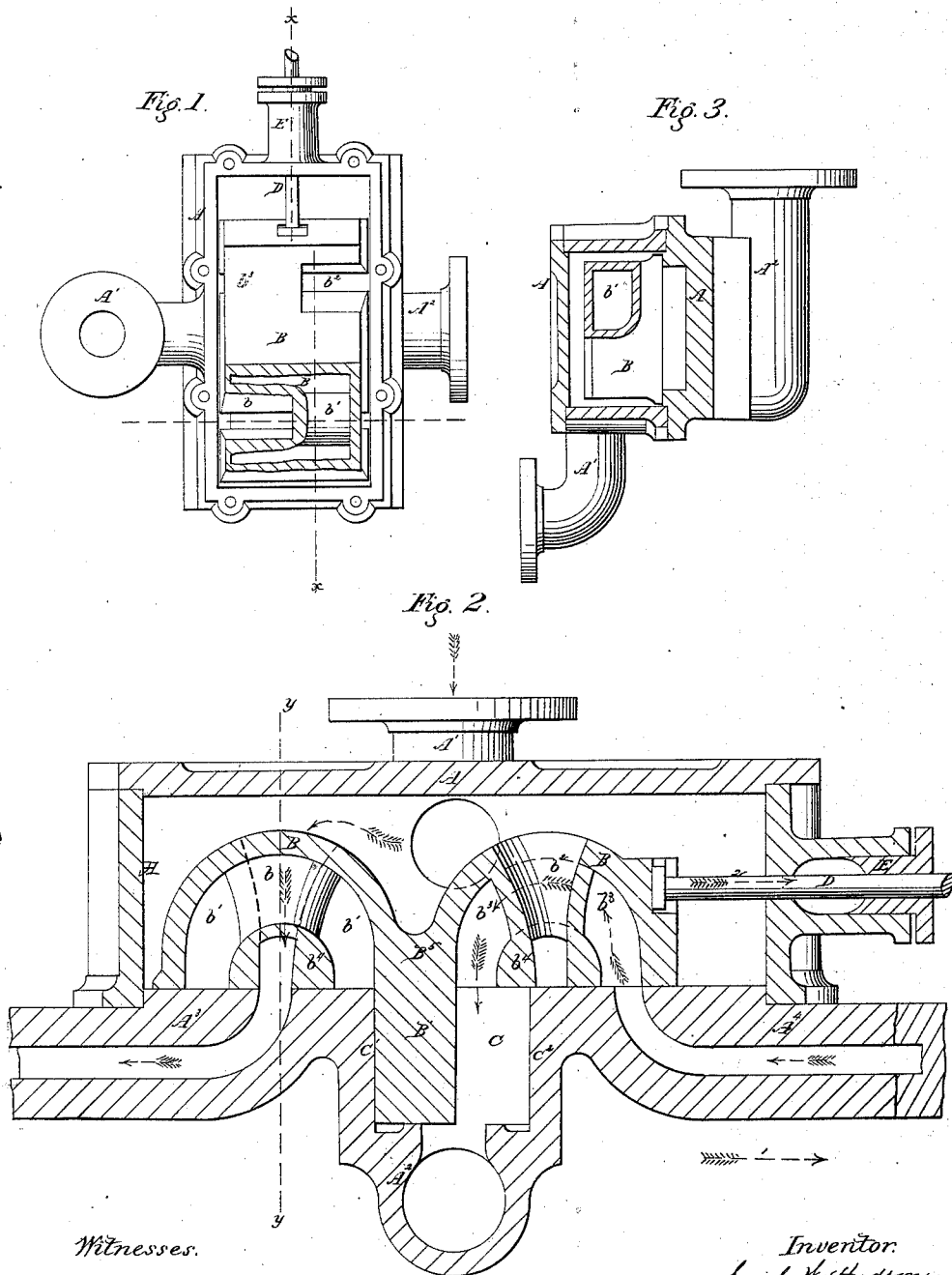


S. W. Hudson.
Steam Slide Valve.

N^o 68,879.

Patented Sep. 17, 1867.



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SAMUEL W. HUDSON, OF BEAVER MEADOW, PENNSYLVANIA.

Letters Patent No. 68,879, dated September 17, 1867.

IMPROVEMENT IN STEAM-ENGINE SLIDE-VALVES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, SAMUEL W. HUDSON, of Beaver Meadow, in the county of Carbon, and State of Pennsylvania, have invented a new and useful Improvement in Slide-Valves; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, which are made part of this specification.

This invention consists in the construction of a slide-valve, with a wing projecting downward from its sole, whereby to operate the valve mainly from the exhaust steam. It further consists in a duplex arrangement of the steam-passages of the valve, whereby the valve when actuated is moved in the same direction as the piston.

Figure 1 is a plan partly in section of a steam-chest and slide-valve constructed according to my invention.

Figure 2 is a vertical longitudinal section of the same, the planes of section being indicated by the lines *x x*, fig. 1.

Figure 3 is a vertical transverse section of the same, the line *y y*, fig. 2, indicating the plane of section.

Similar letters of reference indicate corresponding parts in the several figures.

A is a steam-chest; *A*¹ the steam-port conveying steam thereto; *A*² the exhaust-port; and *A*³*A*⁴ the channels, which convey steam to either end of the cylinder and conduct it therefrom, in customary manner. *BB* is a duplex slide-valve, from the sole of which a wing, *B*¹, projects downward into the cavity or chamber *C*, which is formed below the valve-chest, and just above the exhaust-port *A*² with which it is in communication. The construction of the valve will be best understood by the aid of fig. 2. The two distinct parts *BB* of the valve are separated by the central partition *B*³, of which the wing *B*¹ is but a continuation. Each part *B* has two steam-passages, *b*¹*b*²*b*³, respectively. The passages *b*¹*b*³ extend archwise over the central portion *b*⁴ of the sole of each part *B* of the valve, and either one or the other of these passages is always in a position to afford communication between one of the channels *A*³*A*⁴ and the exhaust-port *A*². In like manner either one or the other of the passages *b*² is always in a position to afford communication between the steam-port *A*¹ and one of the channels *A*³*A*⁴. *D* is the valve-rod working through a suitable stuffing-box, *E*, and having a suitable tappet connection with the piston which gives the valve an impulse in the direction of the piston's movement when said piston is about to complete its stroke.

In order to explain the operation, let it be supposed that the piston is moving in the direction of the arrows 1-2, and that the position of the valve is such as represented in fig. 2. Such being the case, the course of the live steam from the steam-port *A*¹ is down through the central passage *b* into channel *A*³, which conducts it into the cylinder; and the course of the exhaust steam is through the channel *A*⁴, passage *b*³, chamber *C*, and thence through the exhaust-port *A*². Under this position of the valve it will be observed that both ends of the passage *b*¹, as also the lower end of passage *b*², are closed by the bottom of the steam-chest upon which they rest. The piston, when about to complete its motion in the direction above indicated, actuates the valve through the tappet connection, so as to move the valve in the same direction, thereby placing the passage *b*² in communication with channel *A*⁴, and the passage *b*¹ in communication with channel *A*³ and chamber *C*. The motion which the valve thus derives directly from the piston is merely sufficient to open a contracted passage-way between one end of *b*¹ and *A*³, and the other end of *b*¹ and *C*, the remainder and greatest proportion of the valve's motion being effected by the action of the exhaust steam upon the wing *B*¹, such steam expanding in chamber *C*, between the wall *C*¹ and the wing or projection *B*¹. By this action of the exhaust steam on its way to the exhaust-port *A*², the motion of the valve necessary to effect its reversal is completed, such motion of course terminating when the wing *B*¹ reaches the wall *C*² of the chamber *C*. Returning, the piston, near the completion of its stroke, again gives the valve its initial movement, when the passage *b*³ conveys exhaust steam from *A*⁴ to *C*, wherein the steam acting against the wing *B*¹ and the wall *C*² moves the valve to the position shown in fig. 2. In order to equalize the steam pressure upon the valve the passages *b*² and *b*¹ are situated at diagonally opposite positions of the valve, as seen in fig. 1.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The wing *B*¹ projecting from a slide-valve to move it by the action of steam, substantially as described.
2. The arrangement of the steam-passages *b*¹*b*²*b*³, substantially as and for the purpose specified.

To the above specification of my invention I have signed my hand this 20th day of June, 1867.

SAMUEL W. HUDSON.

Witnesses:

OCTAVIUS KNIGHT,
JAMES L. EWING.