S. H. BEVINS, J. WEIS & W. H. PHILLIPS.

REVERSING VALVES FOR STEAM ENGINES.

No. 186,297. Patented Jan. 16, 1877.

Fig. 3.

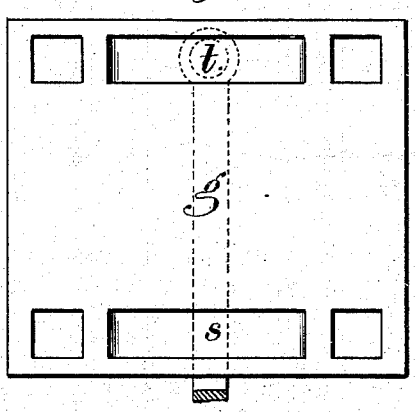
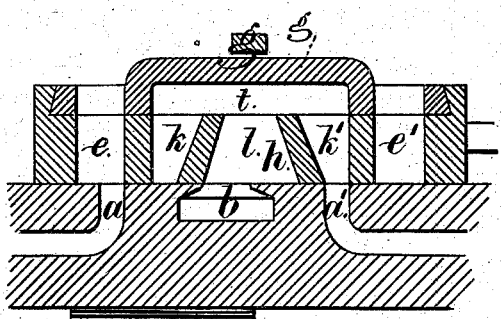


Fig. 5.



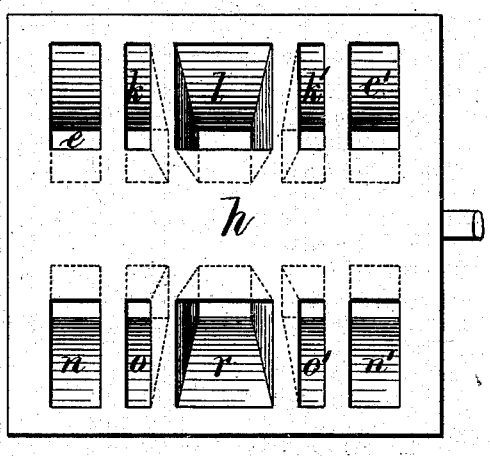


Fig. 2.

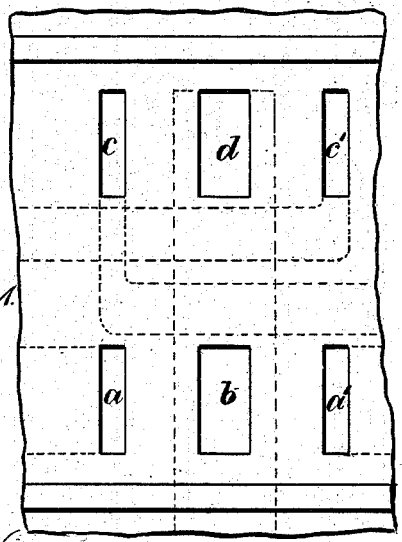


Fig. 1.

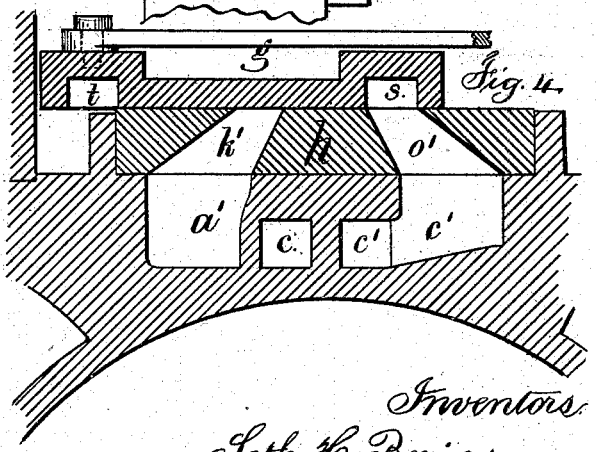


Fig. 4.

Witnesses.
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UNITED STATES PATENT OFFICE.

SETH H. BEVINS, OF NEW YORK, N. Y., JOSEPH WEIS, OF JERSEY CITY, NEW JERSEY, AND WILLIAM H. PHILLIPS, OF NEW YORK, N. Y.

IMPROVEMENT IN REVERSING-VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **186,297**, dated January 16, 1877; application filed December 12, 1876.

To all whom it may concern:

Be it known that we, SETH H. BEVINS, of the city and State of New York, JOSEPH WEIS, of Jersey City, in the State of New Jersey, and WILLIAM H. PHILLIPS, of the city and State of New York, have invented an Improvement in Reversing-Valves for Engines, of which the following is a specification:

We make use of two sets of ports between the valve-seat and cylinder, one set passing direct, the other set crossing, to the opposite ports. Upon this seat is a valve worked in the ordinary manner; but it covers the ports in the valve-seat, and has two sets of ports passing through the valve for both the inlet and the exhaust. Upon this main valve there is a secondary reversing-valve, that has ports and eduction-ways similar to a D slide-valve, but double, and the relative width of the valve and ports is such that the secondary valve can be moved transversely to the main valve and close all the ports of the main valve, or moved to open either set of ports, so that the steam passes direct or through the cross-ports, and causes the engine to revolve either one way or the other.

This invention may be used upon locomotive, propeller, and other engines; but it is especially adapted to engines for hoisting machinery, in which the attendant in the elevator shifts the valve to stop the elevator, or to cause the engine to hoist or to lower the car.

The devices for giving motion to the main valve consist of an ordinary eccentric and rod, or any other suitable appliance may be used for moving the valves, and the connections between the engine and the car, being well known, do not require description. We remark that it is preferable to connect a link to the secondary valve within the steam-chest, and to the rod that passes through a stuffing-box, and is moved by the attendant, in order that the link may swing as the main valve moves without giving motion to the secondary valve.

In the drawing, Figure 1 is a plan of the valve-seat. Fig. 2 is an inverted plan, showing the face of the main valve. Fig. 3 is an inverted plan of the face of the secondary valve. Fig. 4 is a cross-section of the valves and upper part of the cylinder, and Fig. 5 is a section longitudinally of the cylinder.

In the valve-seat are the ports *a a'* to the ends of the cylinder and the exhaust-port *b*, and there is a second range of ports, *c c'*, that cross in the metal of the cylinder, so that the port *c'* goes to the same end of the steam-cylinder as the port *a*, and the port *c* to the same end as the port *a'*. There is also an exhaust-port, *d*, connecting with the exhaust *b*.

The main valve *h* is made with two ranges of ports, one working over the ports *a b a'*, the other over the ports *c d c'*, and the arrangement of ports in the valve *h* is different from those in the ordinary valve.

The ports *e e'* are inlet steam-ports, acting with the steam-ports *a a'*, and the exhaust-ports *k k'* act to allow the exhaust to pass from either *a* or *a'*, up through *k* or *k'*, and through the D-passage *t* of the secondary valve *g*, to the port *l*, and thence to *b*.

The steam-ports *n n'* act with the ports *c c'*, and the exhaust-ports *o o'* and central exhaust *r* act with the D-passage *s* in the secondary valve *g*.

It is now to be understood that when the secondary valve is in a position to admit steam to the ports *a a'* the engine will revolve in one direction, and when this secondary valve closes the steamways to *a a'*, and opens those to *c c'*, the engine revolves the other way, in consequence of the ports crossing.

The ports in the main valve *h* incline toward each other, so that the openings are nearer together at top than at bottom. This lessens the width of the secondary valve *g*, and allows it to be made to cover and close all the ports and stop the engine, or to be moved either one way or the other, to give motion in either direction, and at the same time the width of the steam-chest is not increased.

We claim as our invention—

The main valve with two ranges of ports, and the valve-seat with two ranges of ports, one direct and the other crossed or reversed, in combination with the secondary valve, having the D exhaust-passages, substantially as set forth.

Signed by us this 9th day of December, A. D. 1876.

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Witnesses:
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