

H. BOLTHOFF.

Slide-Valves for Steam-Engines.

No. 156,270.

Patented Oct. 27, 1874.

Fig: 1.

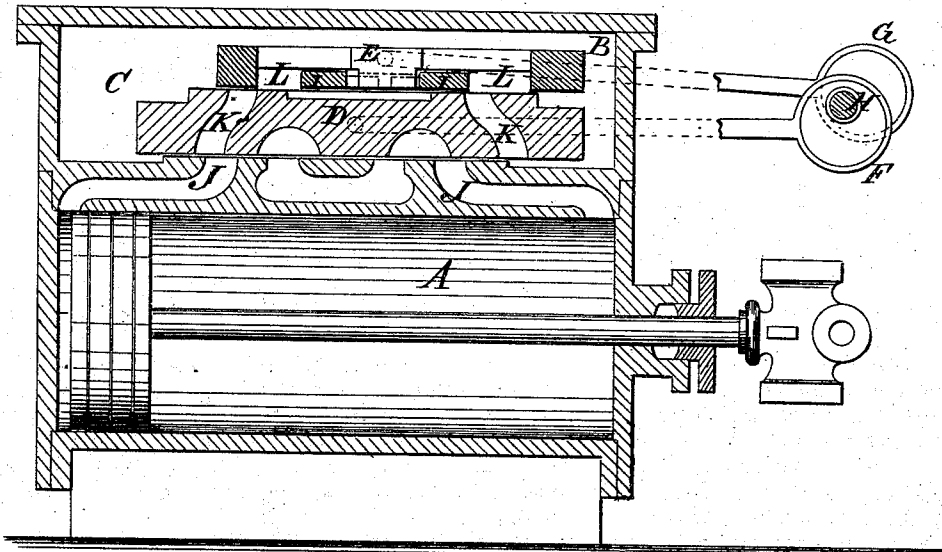
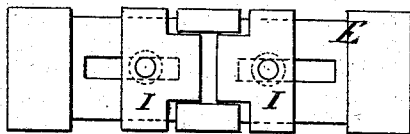


Fig: 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

HENRY BOLTHOFF, OF CENTRAL CITY, COLORADO TERRITORY, ASSIGNOR
TO HIMSELF AND JAMES CLARK, OF SAME PLACE.

IMPROVEMENT IN SLIDE-VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **156,270**, dated October 27, 1874; application filed
August 1, 1874.

To all whom it may concern:

Be it known that I, HENRY BOLTHOFF, of Central City, in the county of Gilpin and Territory of Colorado, have invented a new and useful Improvement in Slide-Valves for Steam-Engines, of which the following is a specification:

The invention will first be fully described, and then pointed out in the claims.

In the accompanying drawing, Figure 1 is a vertical longitudinal section of a steam-engine, showing the slide-valve arranged to operate according to my invention. Fig. 2 is a top view of the upper part of the valve.

Similar letters of reference indicate corresponding parts.

A is the main cylinder. B is the steam-chest. C is the slide-valve. This slide-valve is composed of two parts, D being the lower part and E the upper part. These parts are connected with the two eccentrics, F and G, which are on the main shaft H. The eccentrics are so arranged on the shaft that the parts D E are simultaneously moved in opposite directions. The valve is so set as to about half open the main port, more or less, as the case may require, when the crank is on the center. This half-opening is made preparatory to the opening of the port above. The upper part E is moved in an opposite direction, consequently the full opening is made in less than the usual time required by the ordinary valve. This result cannot be obtained except with a double valve. It requires both movements to produce the result and obtain the opening for admitting steam to the cylinder. The part E is constructed with steam-ports, the same as the part D. This part E has on the inside of each port an adjustable jaw or block, I, for the purpose of increasing and decreasing the size of the ports for cutting off steam at any point of the stroke that may be desirable. J are the steam-ways to the cylinder; K, the ports or ways through the parts D of the valve; L, the ports of the part E of the valve.

The two parts D E thus perform the duty of the main valve of ordinary steam-engines,

but in a superior manner—that is, by moving the parts in opposite directions, and thereby increasing the speed of the opening of the port one-half. At the point of taking steam these parts move at their greatest speed. This is accomplished by the direct action of the eccentrics alone.

In ordinary engines "lead" is generally given for obtaining an increased opening at the time the piston begins to travel, thereby causing friction at a point where the crank is without leverage, and is moved by the acquired momentum, causing a loss of power at that point.

By my improvement this difficulty is obviated, as the steam is not admitted until the piston is on its stroke.

The increased speed of the opening supplies the piston with steam at the proper time, thereby avoiding the invariable loss sustained by the action of the ordinary valve.

It will be seen that with this double valve, for quickly admitting steam to the cylinder, I have combined a variable cut-off, which is readily adjusted to the duty required of the engine.

I am aware that there is nothing new in the idea of two valves arranged one upon the other and moving in opposite directions, and serving the purpose of cut-off and main valves, respectively, and I therefore do not wish to be understood as making claim to such invention; but

Having described my invention, what I claim as new therein is—

1. The combination, with cylinder having ports J J, of the valve D, having ports K K, and the valve E, having ports L L, said valves moving simultaneously in opposite directions, as and for the purpose described.

2. The two-part slide-valves D and E adapted to move in opposite directions, in combination with the adjustable blocks I I, as and for the purpose specified.

HENRY BOLTHOFF.

Witnesses:

HENRY M. SELLERS,
C. C. WELCH.