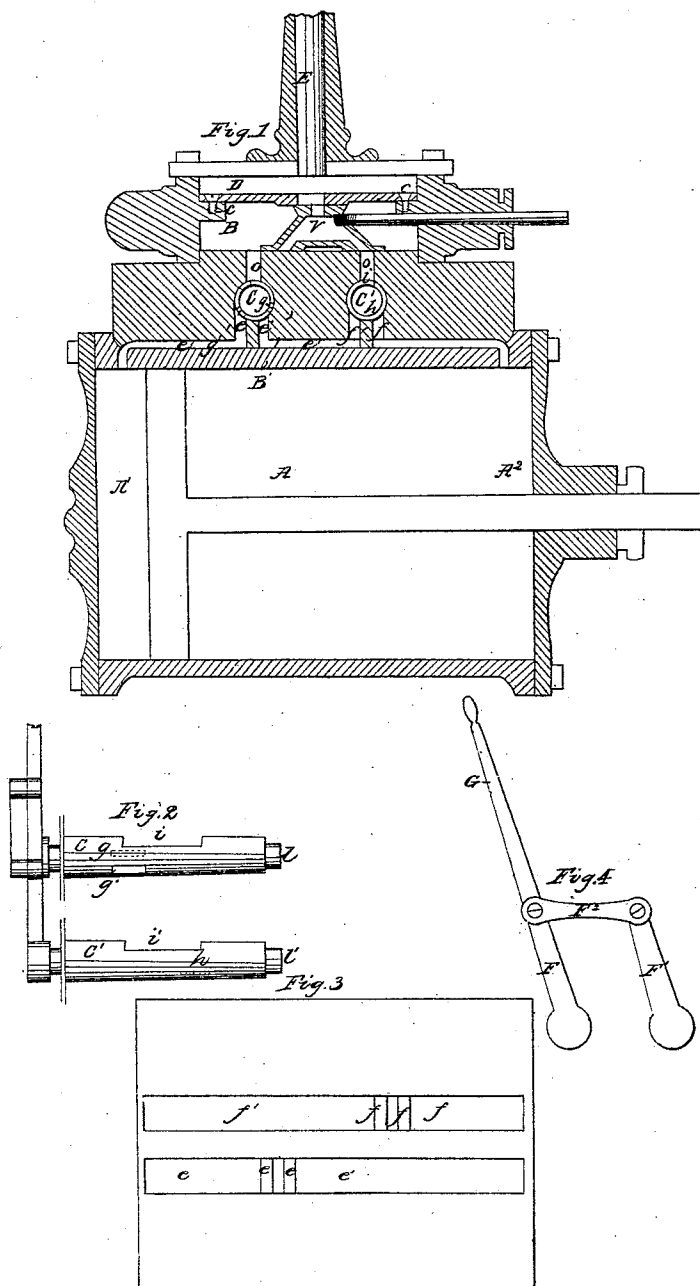


*L. Atwood,
Steam Cut-Off.*

N^o 83,903.

Patented Nov. 10, 1868.



Witnesses

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LEONARD ATWOOD, OF NORWICH, CONNECTICUT.

IMPROVEMENT IN VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **83,903**, dated November 10, 1868.

To all whom it may concern:

Be it known that I, LEONARD ATWOOD, of Norwich, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Steam-Engines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to a new mode of constructing and operating a steam-counterbalanced slide-valve, and to novel means for reversing the action of the engine by changing the course of the steam between the steam-chest and the cylinder, without changing the operation of the valve.

In the accompanying drawings, Figure 1 is a longitudinal vertical section through the center of the cylinder, steam-chest, and valve. Fig. 2 is a view of the tumblers (hereinafter described) detached from their seats, with the levers for operating them. Fig. 3 is a view of the under side of the base of the steam-chest, which fits onto the upper surface of the cylinder, showing the passage-ways for the steam to and from the cylinder. Fig. 4 is a detached view of the levers for operating the tumblers.

A is the cylinder; B, the steam-chest, and B' the base of the steam-chest, in which are located the tumblers C and C', as well as the ports or steam-passages from the steam-chest to the cylinder and from the cylinder to the exhaust-pipe. V is the steam-counterbalanced valve. D is a partition-plate, screwed down upon a flange, c, in the steam-chest, dividing the same into two compartments, with an opening, d, through which the exhaust-steam escapes; and o o' are two ports or steam-passages leading from the steam-chest to the tumblers C and C'. E is the exhaust-pipe. C and C' are two hollow cylindrical tumblers or intermediate valves between the steam-chest and the cylinder. From the socket-seats of said tumblers to the cylinder there are four passage-ways for the steam to and from the cylinder—viz., e e' and f f'. In the upper side of each of said cylindrical tumblers there is a slot or opening, i i', through which the steam from the steam-chest enters the interiors of said tumblers; and there are other slots or

openings in said tumblers—viz., g and g' in C and h in C'—by means of which the steam passes to and from the cylinder through the ports e e' and f f', according to the position in which said tumblers are turned.

F and F¹ are two levers for operating the tumblers, and F² is a link connecting them together, so that they may be operated simultaneously by means of the handle G.

When these tumblers are turned from right to left, as in Fig. 1, the slot g in the tumbler C will come opposite the port e, and admit steam to the end A¹ of the cylinder, while at the same time the slot h in tumbler C' will come opposite the port f, and allow the exhaust-steam to escape from the opposite end A² of the cylinder; but when the levers are turned so as to incline in the opposite direction, the slot g' in tumbler C will come opposite the port e', and admit steam to the end A² of the cylinder, while at the same time the slot h in tumbler C' will come opposite the port f', and allow the exhaust-steam to escape from the end A¹ of the cylinder, thus reversing the motion of the engine without any change in the movement of the valve.

When the handle G is vertical all the ports leading from the tumblers to the cylinder are closed, and the steam completely shut off from the cylinder.

The tumblers C and C' should be made slightly tapering from their front to their rear ends, and their socket-seats of corresponding form. They should be drawn tightly into their socket-seats by means of screws and nuts on their rear ends at l l'. Any loosening from wear can thus be readily obviated.

It will be obvious that, by means of this simple device for reversing the action of the engine, the necessity for any more than one eccentric for operating the valve is completely obviated, and much heavy and expensive machinery heretofore used is dispensed with.

On the under side of the valve V, between its two ports, the metal is cut away, as shown at n, Fig. 1, so that the steam in the steam-chest will act upon the under side of said valve, to counterbalance the downward pressure upon its upper surface and lessen the friction.

Having thus fully described my invention

and its mode of operation, what I claim as new, and desire to secure by Letters Patent, is—

1. Intermediate valves between the steam-chest and cylinder, to reverse the action of the engine by changing the course of the steam after it has passed the main or induction and eduction valve, substantially as described.

2. The tumblers C and C', in combination with the steam-passages *e*, *e'*, *f*, and *f'*, substantially as and for the purpose described.

3. The steam-counterbalanced valve V, constructed as described, when arranged and operating in relation to the plate D, substantially as described.

LEONARD ATWOOD.

Witnesses:

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