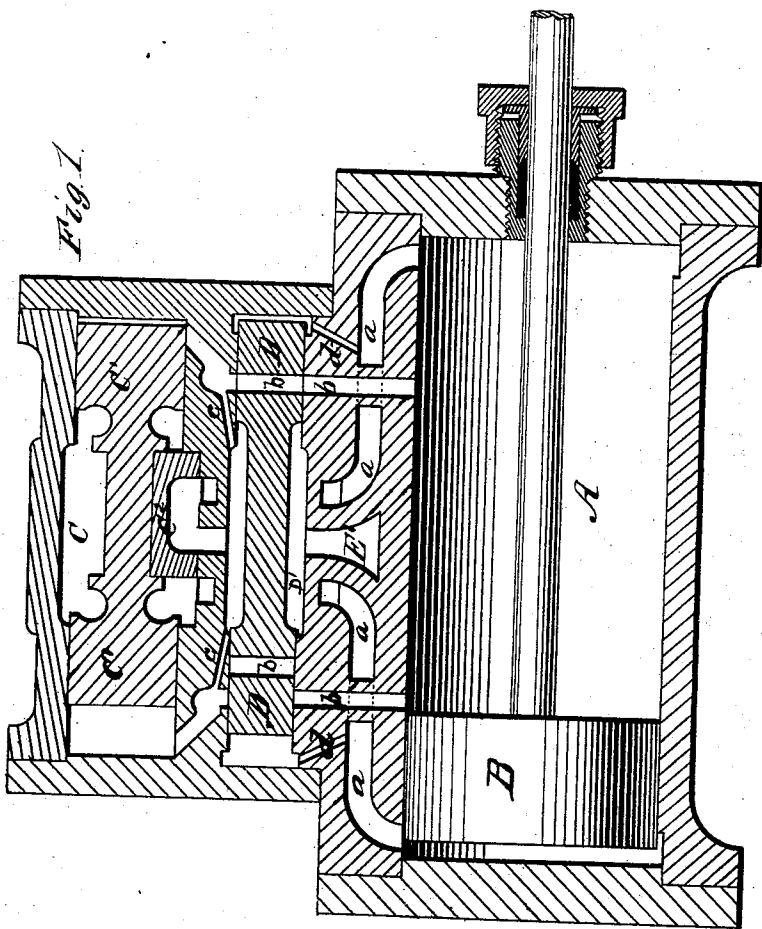
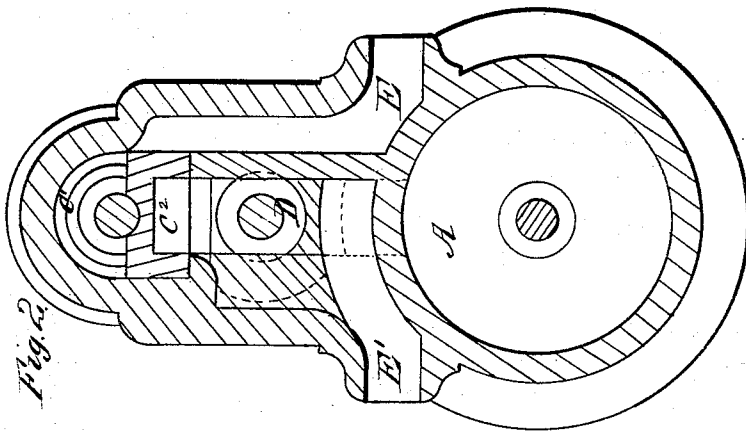


C. ROGERS.
Slide-Valves.

No. 157,027.

Patented Nov. 17, 1874.



WITNESSES

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CHARLES ROGERS, OF ALLEGHENY, PENNSYLVANIA.

IMPROVEMENT IN SLIDE-VALVES.

Specification forming part of Letters Patent No. **157,027**, dated November 17, 1874; application filed September 19, 1874.

To all whom it may concern:

Be it known that I, CHARLES ROGERS, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and valuable Improvement in Slide-Valves; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

This invention has relation to steam-engine valve-gear, as will be hereinafter more fully described and claimed.

In the annexed drawings, A designates the cylinder for the main piston B. C is the steam-chest, in which reciprocates a double-headed piston, C¹, and a slide-valve, C², which latter is movable with the piston C¹. D designates my auxiliary double-headed piston, which is represented arranged between the cylinder A and the steam-chest C; but any other arrangement of this piston D may be adopted. E' designates the main exhaust-port, and *a a* the main steam-ports. There are also ports *b b*, communicating with the steam-chest C, for actuating the piston and slide-valve therein, and ports *c c* for exhausting steam from the chest C, leaving the piston C¹ free to act when steam is admitted at either end of the chest C. There are also ports *d d* for admitting steam to the chamber D', in which works the auxiliary piston D. E' designates the port for conveying steam to the steam-chest C.

The operation is as follows: The piston B in the drawing is at the end of the left-hand stroke. The slide-valve C² is in a position for admitting steam at the left-hand end of the cylinder A through the port *a*, which would move the auxiliary piston D to the position indicated in Fig. 1. The port *b* on the left is closed, and the corresponding port *b* on the right is open, so that during the right-hand stroke of the piston B, when this piston passes the left-hand port *b*, the steam has no communication with piston C¹, as it is cut off by one of the heads of piston D; but after

piston B passes the right-hand port *b*, steam passes direct to piston C¹, and moves it, together with the slide C², to the left, thereby letting steam into the right end of the cylinder. Steam now passes through one of the ports *d*, and moves the auxiliary piston D to the left. Piston B is then carried to the left, and the operation is repeated. The steam-ports *a*, after leaving the slide-valve, pass down on one side of the auxiliary piston-chamber D, and have no communication with it. The exhaust-port cuts into the chamber D', so that the exhaust from ports *c c* may communicate with the main exhaust.

The ports *b b* are bored through the heads of the auxiliary piston D, or they may be formed by grooving the heads of this piston around their peripheries. If the heads are bored through, as shown, there should be a groove and feather to prevent the piston from turning about its axis.

When steam is admitted through ports *b b* to move piston C¹, it is free to escape through ports *c c*, which ports *b b* are more than eight times the capacity of ports *c c*. The live steam can only escape at the smallest ports while the slide-valve is making its stroke, which is very rapid. It is necessary for piston D to remain fixed until after the steam is let into one end of the main cylinder and exhausted at the other end, said steam acting on pistons D and B in the same manner and at the proper times. The cushioning of these pistons is regulated by the size of the small ports *c c* and *d d* in not allowing the exhaust steam to pass off too rapidly.

It will be observed that the double-headed piston D is cut away or recessed, so as to leave small bearing-surfaces at its ends only. This method of construction possesses the advantages of lightness and comparatively small friction.

It will also be observed by my construction and arrangement of the steam-ports, the cylinder C is relieved from any steam that may escape by the pistons C¹.

What I claim as new, and desire to secure by Letters Patent, is—

1. The exhaust-ports *c c*, connecting the

steam-chest C with the chamber D' surrounding the central portion of the double-headed piston D, recessed between its bearing portions, as shown, substantially as described, and for the purpose set forth.

2. The double-headed piston C¹, provided with the slide-valve C², in combination with the auxiliary double-headed piston D, with ports *b b*, the main piston B, ports *a a d d*, exhaust-ports *c c*, all constructed, arranged,

and operated in the manner and for the purpose set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

CHAS. ROGERS.

Witnesses:

ALONZO McCUNE,
ISAAC STEWART.