S. B. GREACEN.

Valve for Compound Engines.

No. 161,779. Patented April 6, 1875.

Fig. 1.

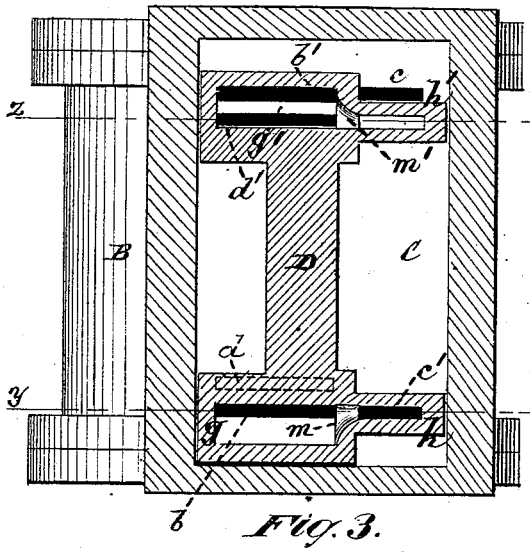


Fig. 2.

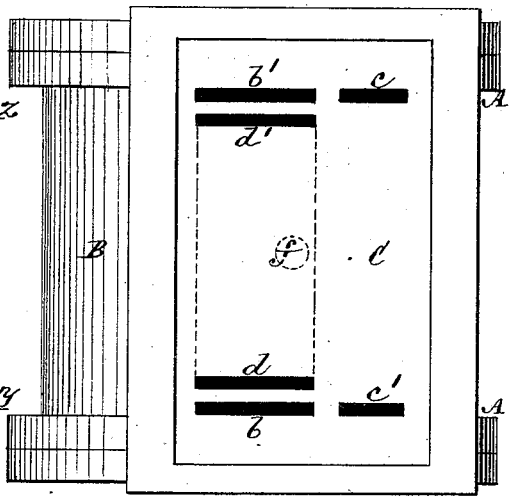


Fig. 3.

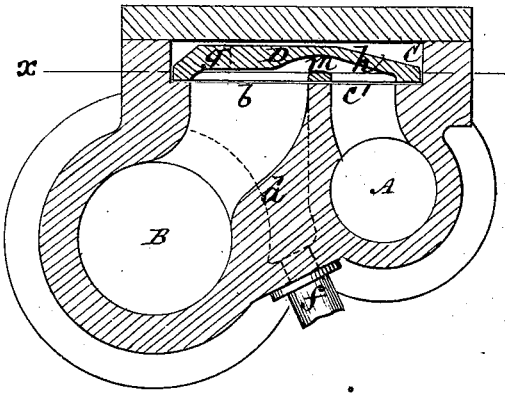


Fig. 4.

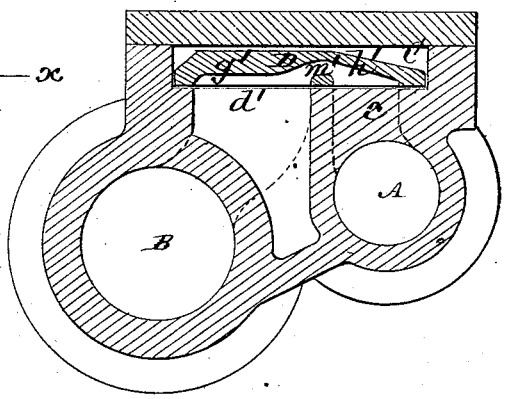
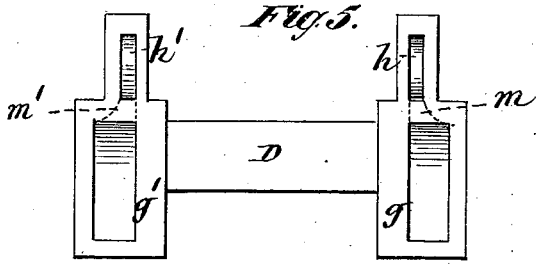


Fig. 5.



Witnesses.
John Becker
Fred. Haynes

S. B. Greacen
by his Attorneys
Brown & Allen

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

UNITED STATES PATENT OFFICE.

STEPHEN B. GREACEN, OF NEWARK, NEW JERSEY.

IMPROVEMENT IN VALVES FOR COMPOUND ENGINES.

Specification forming part of Letters Patent No. **161,779**, dated April 6, 1875; application filed January 12, 1875.

To all whom it may concern:

Be it known that I, STEPHEN B. GREACEN, of the city of Newark, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Valves of Compound Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming part of this specification, and in which—

Figure 1 represents a section parallel with the axes of the two cylinders of a compound engine through the valve-box and valve, on the line *x x;* Fig. 2, a further longitudinal view from the valve-box side, with the cover of said box and the valve removed. Fig. 3 is a transverse section on the line *y y;* Fig. 4, a transverse section on the line *z z*, and Fig. 5 a face or under view of the valve.

This invention consists in a single valve of novel construction, in combination with the ports of the two cylinders controlled by it, whereby a short passage only is necessary to convey the steam from the high-pressure cylinder to the low-pressure one, the ports are all straight and easily cored out, and other advantages are obtained, the whole combining great simplicity with cheapness of construction and economy in operation. A is the high-pressure cylinder of a compound steam-engine, and B its low-pressure cylinder. C is a steam-chest common to both cylinders, and having one valve-seat for a single slide-valve, D, to control both cylinders, and to pass the steam from the high-pressure cylinder to the low-pressure one, after it has performed its duty in the former and smaller cylinder.

The valve-seat has its ports *b b'* and *c c'*, which connect at opposite ends of the valve-chest with the two ends of the cylinders of ordinary construction, and straight, so that they may be readily cored out, and the same advantage applies to the exhaust-ports *d d'*, at least so far as their passage through the valve-seat is concerned. These exhaust-ports, which connect with a common outlet, *f*, are arranged alongside of the ports *b b'*, in proximity to their inner longitudinal edges, and the steam-ports *b b'* of the one cylinder are in line, or thereabout, transversely to the valve-chest, with the steam-ports *c c'*, respectively, of the other cylinder. The valve D, which is a slide one, is arranged to reciprocate in direction of the length of the cylinders, and is constructed at its opposite ends with cavities or hollow faces *g g'*, which serve to alternately close either exhaust-port *d d'*, or to put it and its adjacent steam-port *b* or *b'* in connection with each other, the latter action taking place when it is required to exhaust the cylinder B from its opposite ends alternately, and either exhaust-port *d* or *d'* being closed by the valve and its adjacent steam-port *b* or *b'* being brought under the cavity *g* or *g'* of the valve whenever it is required to pass the steam from the small to the large cylinder from opposite ends alternately. To thus pass the steam from the high-pressure cylinder A to the low-pressure cylinder B after it has performed its duty in the first-named cylinder, and to admit fresh steam alternately to opposite ends of the cylinder A, the valve D is furthermore provided with additional cavities or hollow face portions *h h'*, arranged to alternately uncover the steam-ports *c c'*, for the admission of steam to opposite ends of the cylinder A, and connect first the one and then the other of said ports *c c'* with the inlets *b b'* of the cylinder B, to pass to the latter the spent steam from the cylinder A. For this latter purpose it is merely necessary to connect the cavities *h h'* with the cavities *g g'* by short passages or apertures *m m'* in the valve, thus wasting but little or no steam.

As the passages in the valve-seat are arranged in the drawing, the pistons of the two cylinders will simultaneously work in opposite directions, and may connect with oppositely-set cranks on the driving-shaft of the engine. If desired, however, the passages *c c'* may be crossed to connect with opposite ends of the cylinder A, to work both pistons in the same direction simultaneously without changing the construction of the valve.

The valve D may be worked by an ordinary eccentric, or by other valve-gear, and an independent cut-off, if desired, may be applied to the cavities or hollow face portions *h h'* of the valve, for cutting off the supply of steam to the cylinder A at any point in the stroke of its piston, and such cut-off be operated in

the same way as similar cut-offs are operated for simple engines.

I claim—

The valve D, constructed with connecting passages or apertures *m m'* between the cavities or hollow face portions *g g'* and *h h'* of the valve, in combination with the ports *b b'*, *c c'*, and *d d'* in the valve-seat, the whole being arranged for operation substantially as shown and described.

S. B. GREACEN.

Witnesses:

MICHAEL RYAN,

FRED. HAYNES.