

(Model.)

C. P. WETHERILL.
BALANCED SLIDE VALVE.

No. 319,649.

Patented June 9, 1885.

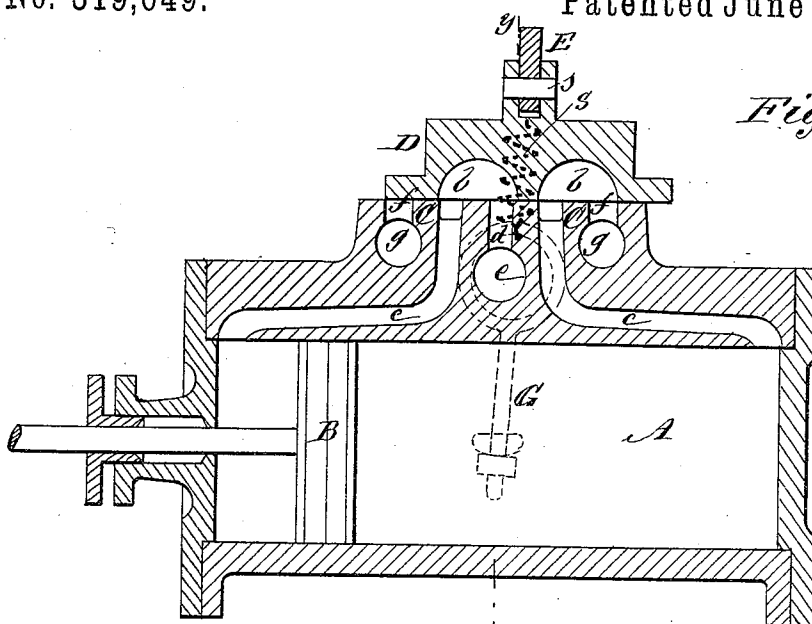


Fig. 1

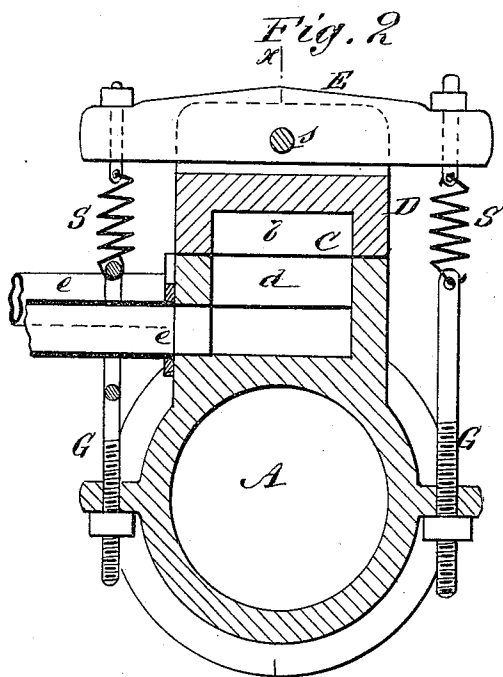


Fig. 2

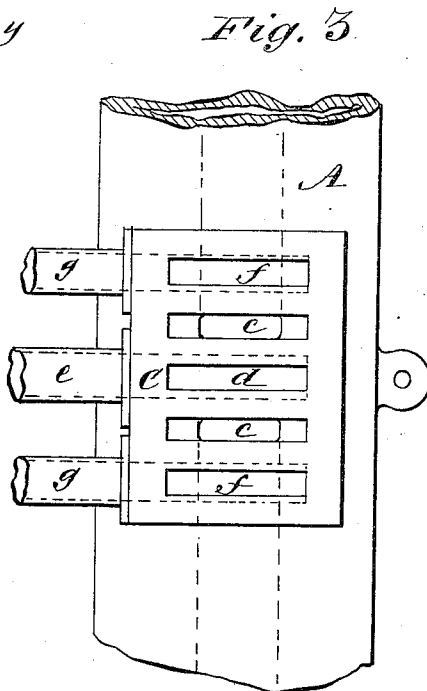


Fig. 3

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UNITED STATES PATENT OFFICE.

COTESWORTH P. WETHERILL, OF WOODVILLE, MISSISSIPPI.

BALANCED SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 319,649, dated June 9, 1885.

Application filed April 7, 1885. (Model.)

To all whom it may concern:

Be it known that I, COTESWORTH P. WETHERILL, of Woodville, in the county of Wilkinson and State of Mississippi, have invented certain new and useful Improvements in Balanced Slide-Valves for Engines, &c., of which the following is a full, clear, and exact description.

The invention relates to improvements in slide valves; and it consists in means for holding the valve to the seat, all as hereinafter fully described, and pointed out in the claim.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 represents a longitudinal section on the line *xx* in Fig. 2 of an engine-cylinder with slide-valve in its place thereon, all being constructed and arranged in accordance with my invention. Fig. 2 is a transverse section on the line *yy* in Fig. 1; and Fig. 3, an exterior longitudinal view, in part, of the engine-cylinder, exposing the valve-seat and with the valve removed.

A indicates the engine-cylinder, and B its piston.

C is the valve-seat, and D the slide-valve, fitting thereon. Said valve has two cavities, *b b*, in its face, arranged one in advance of the other, and which, as the valve is reciprocated, alternately open to the "steam" and "exhaust" the ports or passages *c c*, which connect, respectively, the opposite ends of the cylinder.

The valve-seat C has in all five ports or passages—that is to say, a central port, *d*, which connects with a steam pipe or inlet, *e*, the ports *c c* on opposite sides of said central port, *d*, and two outer ports, *f f*, respectively arranged beyond the ports *c c* and connecting with exhaust pipes or outlets *g g*.

As the valve D is slid backward and forward over these several ports, the cavities *b b* in it will distribute the steam or other pro-

pellling fluid, gas, or vapor to and exhaust from opposite ends of the engine-cylinder alternately, the steam entering by the central port, *d*, either cavity *b b* in the valve, and being passed to the cylinder by the one port or passage *c*, also connecting with said cavity, while the exhaust-steam will pass by the other port *c* from the opposite end of the cylinder to the other cavity *b*, and from thence by the port *f* in connection with said cavity to one of the outlets *g*. This is the action in both movements of the valve, only the ports open to the steam and exhaust being changed by the relative position of the cavities *b b*, respectively, to them. This valve may be operated by an eccentric set, as in ordinary engines, ahead of the crank, in order that the valve may move in the direction the piston moves.

The valve D requires no steam-chest, and is held to its seat by spiral or other suitable springs, *S S*, arranged on opposite sides of the valve and connected, respectively, at their one end with the opposite ends of a cross-bar, *E*, intermediately pivoted, as at *s*, and extending across the valve at its center, and at their other end with adjusting screw-bolts *G G*, and nuts connecting them with opposite sides of the cylinder. By this adjustable spring-hold of the valve to its seat the valve may be balanced, or nearly so, to or as against varying pressure of the steam, and, as there is no chest to conceal the valve, the condition of the valve as to tightness may always be seen.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The combination, with the valve D and its seat C, of the pivoted cross-bar *E*, the springs *S S*, and the adjusting screw-bolts *G* with their nuts, substantially as specified.

COTESWORTH P. WETHERILL.

Witnesses:

WM. M. WETHERILL,
E. A. ROBINSON.