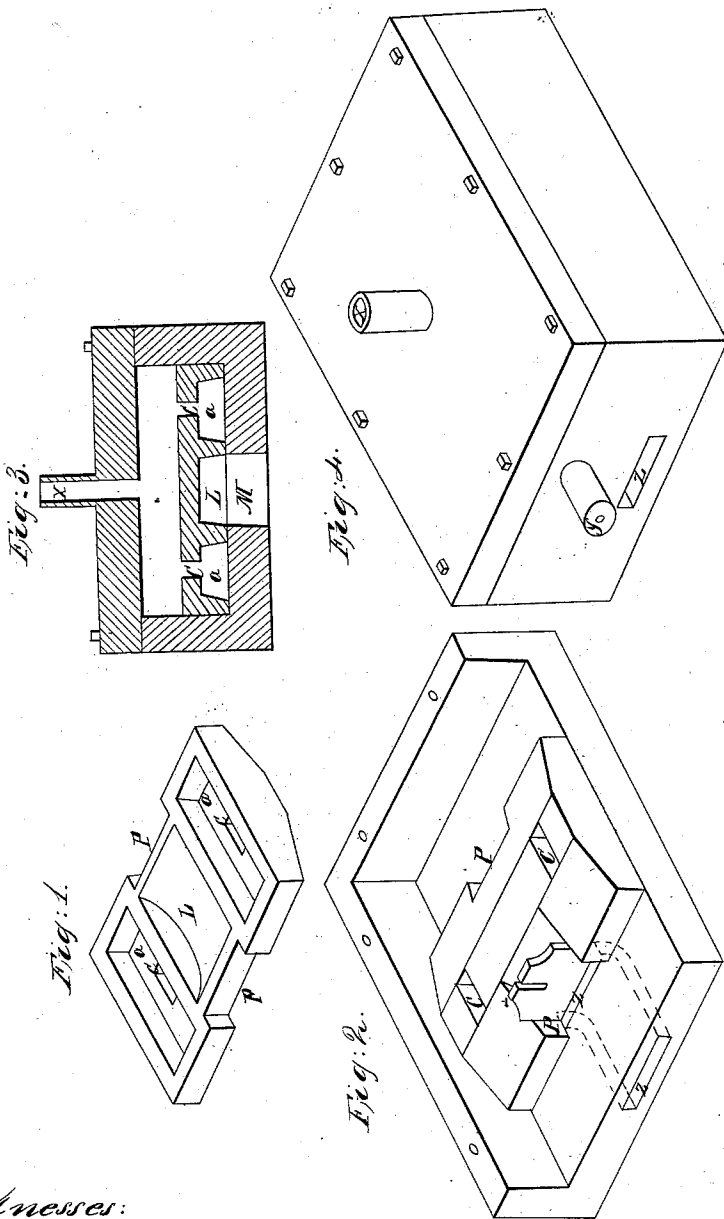


S. Groom,

Steam Balanced Valve.

N^o 43,402.

Patented July 5, 1864.



Witnesses:
Edw. S. Cushman
A. Van Dyke

Inventor:
Smith Groom

UNITED STATES PATENT OFFICE.

SMITH GROOM, OF TROY, NEW YORK.

IMPROVEMENT IN VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **43,402**, dated July 5, 1864.

To all whom it may concern :

Be it known that I, SMITH GROOM, of the city of Troy, in the county of Rensselaer and State of New York, have invented a new and useful Improvement in Slide-Valves of Steam-Engines; 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, in which—

Figure 1 represents in perspective the slide-valve reversed or turned downside up, for the purpose of showing more perspicuously the various cavities or chambers therein and their relation to each other. Fig. 2 represents in perspective the interior of the steam-chest, the top plate, and also one end and one side thereof, being left off for the purpose of a better view, and also represents the slide-valve right side up and in position for working, one cylinder-port, together with the exhaust-port, being covered thereby, the other cylinder-port, Z, being uncovered by said slide-valve. Fig. 3 represents a transverse section of said steam-chest and slide-valve, showing the relative position of the slide-valve chambers *a a*, together with their respective ports *c c* and the exhaust-chamber L, the exhaust-port M, also a section of the steam-supply pipe X. Fig. 4 represents in perspective a view of the exterior of the steam-chest as put together, X representing a section of the steam-supply pipe at the top, connecting said steam-chest with the boiler, Z representing a portion of one of the cylinder-passages connecting the cylinder with its respective port in the steam-chest, Y representing the bearing or or aperture through which the slide-valve rod reciprocally moves.

The same letters represent like parts in each figure.

I make the steam-chest with its exhaust-port and connections, also its cylinder-ports and respective connections, also its steam-supply pipe connecting said steam-chest with the boiler, as are the corresponding parts in other steam-chests commonly in use.

The rod that communicates motion to the slide-valve is attached thereto at the vertical seat N, Fig. 2. The steam-chest I make so much wider in proportion to its length than others commonly in use as will allow a slide-

valve to operate therein, having two counter-balance chambers, *a a*, Figs. 1, 2, 3, herein-after described. I make said slide-valve, Figs. 1, 2, 3, having a cavity or chamber, L, on the under side thereof, of sufficient capacity so as to freely pass off the exhaust-steam from the cylinder through the exhaust-port M in the floor of said steam-chest, directly beneath and covered by said slide-valve chamber L, said last-named chamber being so made as that a margin of sufficient width shall remain around the periphery thereof as effectually to shut off from said chamber L direct communication with the steam in the steam-chest. Said chamber L is of sufficient length and breadth as only to cover at one and the same time the exhaust-port M and also one cylinder-port; and thus, while the steam in the steam-chest is passing through the cylinder-port Z, Fig. 2, into one end of the cylinder, the exhaust-steam from the other end of the cylinder passes through the other cylinder-port into the chamber L, and thence out through the exhaust-port M, Fig. 3, and vice versa, when the said slide-valve shall recede to the other extreme and cover the other cylinder-port, Z. Notches P P are made on the opposite edges of said slide-valve, Figs. 1 and 2, and correspond as to length with the cylinder-ports, respectively, for the purpose of reducing the surface of the slide-valve at or near the chamber L, subjected to pressure by the steam. These notches may be omitted at my option. I make two chambers or recesses, *a a*, Figs. 1 and 3, on the under side of said slide-valve—one on each side of said exhaust chamber L—each chamber *a a* having through the dome or upper part thereof a port, *c c*, through which the steam of the steam-chest passes freely and continuously into said chambers *a a*, respectively, each of last aforesaid chambers also having a margin around their periphery of sufficient width as effectually to shut off all communication with or escape of steam therefrom into the exhaust-chamber L. Consequently the pressure of steam within these chambers *a a* counterbalance in part the downward pressure of the steam in the steam-chamber against the upper surface of said slide-valve, the steam in said chambers *a a* acting also as cushions, and at the same time lubricating the bearings of said slide-valve, essentially lessen the friction and consequent wear of the bearings of the

