J. Kershaw,

Steam Balanced Valve.

No. 42,950. Patented May 31, 1864.

Fig: 1

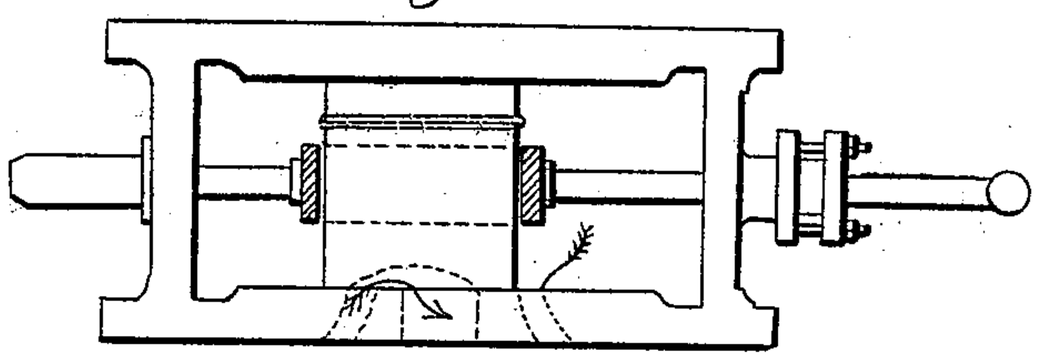
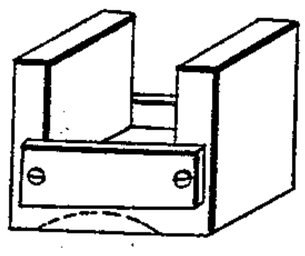


Fig: 2.



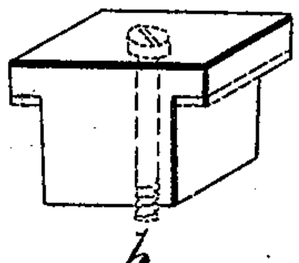


Fig: 3.

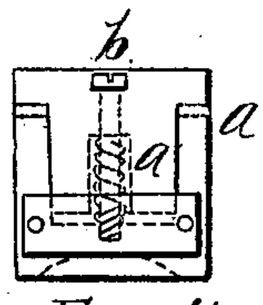


Fig: 4.

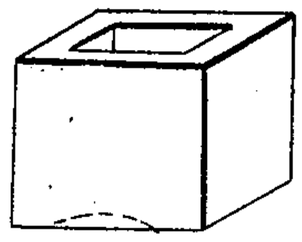


Fig: 5.

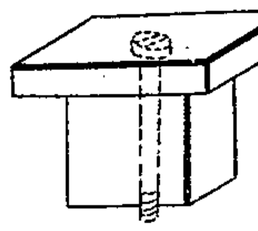


Fig: 6.

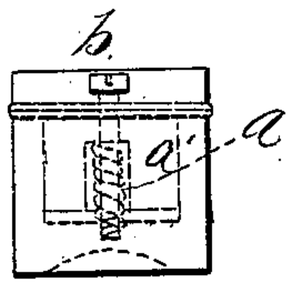


Fig: 7

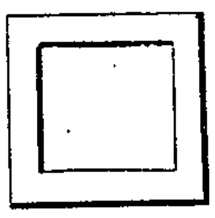


Fig: 8

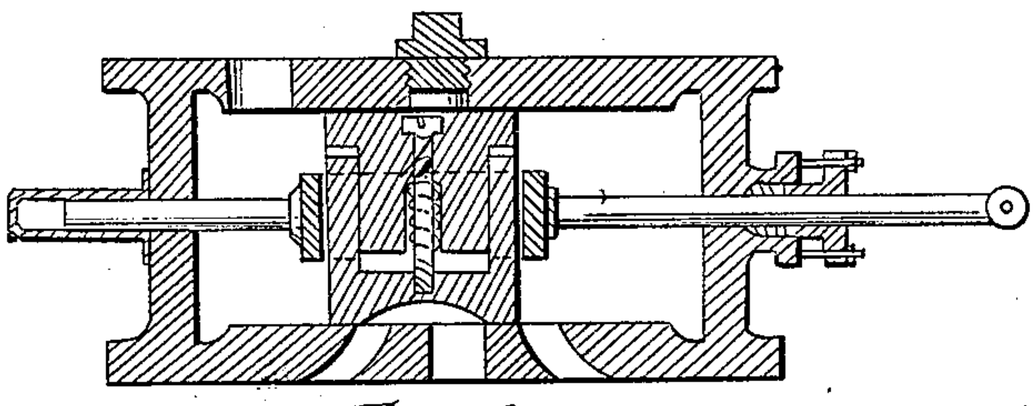


Fig: 9.

Witnesses:
Edward M. Watson.
Lawrence Holms Jr.

Inventor:
James Kershaw

UNITED STATES PATENT OFFICE.

JAMES KERSHAW, OF PATERSON, NEW JERSEY.

IMPROVEMENT IN SLIDE-VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **42,950,** dated May 31, 1864.

To all whom it may concern:

Be it known that I, JAMES KERSHAW, of Paterson, in the county of Passaic and State of New Jersey, have invented a new and useful Improvement in Steam Slide-Valves, whereby the friction usually attendant on the use of the common slide-valves, and which is the result of the pressure of the steam acting upon the back or exterior surface of the valve, is neutralized or extinguished; and I 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 accompanying drawings, in which—

Figure 1 is a longitudinal view of the usual valve-chest, with the valve in its place, and the upper portion of it working steam-tight against the back or cover of the valve-chest, which is planed parallel with the usual valve-seat. The upper and lower surfaces of the valve being protected from pressure, and the four other surfaces being equally exposed to the action of the steam, the valve is thus placed in an equilibrium of pressure, on the principle of action and reaction being equal and in opposite directions. Fig. 2 is a perspective view of the lower portion of the valve, consisting of the valve proper, with a square recess or chamber on its upper surface, into which fits snugly a plunger or follower, Fig. 3, the flat upper surface of which is sustained in contact with the valve-chest cover by a packing of india-rubber, and a spiral or other spring, as seen at *a'*, Fig. 4. A screw, *b*, is introduced through the follower, which is screwed into the center of the lower part of the valve, for the purpose of regulating the contact of the surfaces. This screw can be reached through a small opening in the back or cover of the valve-chest at any time without breaking any joint or in any way disturbing any of the several parts. Figs. 5 and 6 are perspective views of a construction of valve wherein the lower portion of the valve has a box-like chamber, and the upper portion has a corresponding square follower fitting into the same, the india-rubber packing *a* in this case being formed as in Fig. 8. Fig. 7 is an end view of the box-like valve shown in Figs. 5 and 6. Fig. 9 is a sectional view of the valve-chest and valve.

I do not claim the equilibrium or balanced steam slide-valve when obtained by removing the pressure of steam from the back of the same by bringing it into contact with the inner surface of the valve-chest cover, for that has been done before; but

What I do claim as my invention is—

A balanced steam slide-valve, when constructed of two principal parts, in the manner shown and described—that is to say, the box-like chamber or its equivalent, on the back of the lower portion or valve proper, and the corresponding follower on the lower side of the upper plate fitting therein, and regulated by the screw *b*, the spring *a'*, and the india-rubber packing *a*, as shown, when combined together and with the parallel surfaces of a valve-chest on purpose to produce a steam slide-valve working in an equilibrium of pressure, as set forth.

JAMES KERSHAW.

Witnesses:

EDWARD M. WATSON,

LAWRENCE HOLMS, Jr.