

R. G. BISHOP.
Balanced Slide-Valve.

No. 201,151.

Patented March 12, 1878.

Fig. 1.

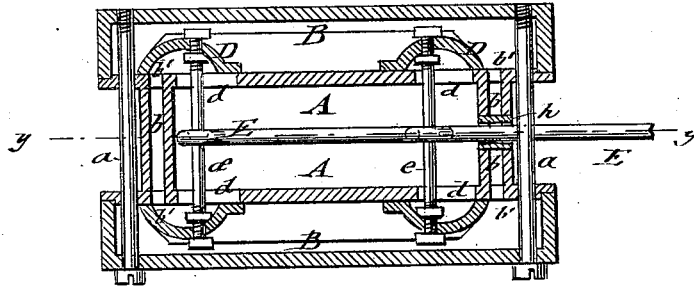


Fig. 2.

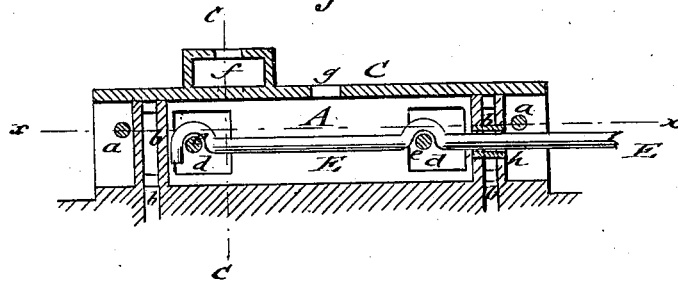
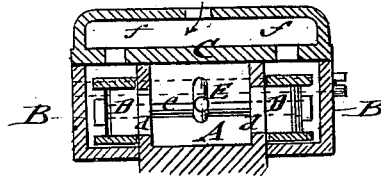


Fig. 3.



WITNESSES:

E. Wolff.
C. Sedgwick

INVENTOR:

R. G. Bishop

BY

Munn & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

RUFUS G. BISHOP, OF CHETOPAH, KANSAS.

IMPROVEMENT IN BALANCED SLIDE-VALVES.

Specification forming part of Letters Patent No. **201,151**, dated March 12, 1878; application filed January 2, 1878.

To all whom it may concern:

Be it known that I, RUFUS G. BISHOP, of Chetopah, in the county of Labette and State of Kansas, have invented a new and Improved Balanced Slide-Valve, of which the following is a specification:

In the accompanying drawings, Figure 1 represents a horizontal section of my improved balanced slide-valve on line *x x*, Fig. 2. Figs. 2 and 3 are vertical longitudinal and transverse sections of the same, respectively, on lines *y y*, Fig. 1, and *c c*, Fig. 2.

Similar letters of reference indicate corresponding parts.

This invention has reference to an improved balanced slide-valve of simple and durable construction, that is not liable to wear out and leak, and can be used with advantage on any steam-engine.

The invention consists of a center chest cast on the cylinder, and of side chests secured thereto. At both ends of the center box are lateral chambers, opening by ports into the cylinder, for inducting and educting the steam, the lateral ports opening also side-wise into the side chests, in which two slide-valves, that are connected by transverse screw-bolts, are reciprocated.

The center chest communicates, by large exhaust-openings, with the slide-valves and cylinder, and is exhausted through the lid of the chests, the steam entering through a raised top or branched pipe to the side chests.

Referring to the drawings, A represents the center chest, which is preferably cast in one piece with the cylinder; and B, the side chests, which are firmly bolted thereto by means of transverse bolts *a*, passing through the ends of the side chests.

The center and side chests are closed by a tightly-fitted lid, C, screwed over the same. The outer surfaces of the side walls of the center chest A are planed off to form the valve-seats of the slide-valves D. The valve-seats have the advantage of being readily reached for planing by removing the side chests.

The side chests are connected with the engine by transverse chambers *b* at both ends of the main chest, that open into the cylinder,

and communicate, also, by side ports *b'*, with the side chests. The side chests communicate through the end chambers *b* and arched or scooped parts of the slide-valves D, with the center chest A, which has large exhaust-openings *d*.

The slide-valves C are laterally connected by screw-bolts *e*, and worked jointly by the eccentric-rod E, connected to the eccentric. The valves, being hung together, are perfectly balanced, as their surfaces are alike.

The steam enters into the side chests either by a raised box or top, *f*, and side openings of lid, or by a pipe branching out to the side openings of the lid, so as to induct the steam simultaneously to both side chests. The steam is exhausted through a port, *g*, in the center part of the lid.

The slide-valves are more or less tightly pressed on their seats by the connecting-bolts, the inner and outer nuts of which at the ends admit the adjustment of the valves on the seats.

The eccentric-rod is attached in suitable manner to the screw-bolts, and guided in a thimble or tube, *h*, passing around the rod through the end chamber *b*. The rod needs no packing, as only exhaust-steam is around the rod, the live steam being prevented from escaping by the guide-thimble.

The stay-rods of the valves work in the exhaust-openings of the chests, and are not in the way, the arched parts of the valves being made long to correspond to the long exhaust-openings.

The entrance-ports to the cylinder are short, so that the steam is conducted to the piston directly without crooked passages. The wear of the valves will be even and the running of the same easy, as the valves are perfectly balanced, the steam being inducted at one end through one of the end chambers and ports, and exhausted freely through the port and chamber at the other end, and through the large exhaust-openings of the center chest to the outside.

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

The combination of a center chest, having

transverse end chamber, with bottom and side ports of side chests applied tightly to both sides of the center chests, and of laterally-connected and balanced slide-valves, moving along outer seats of the center chest, for conducting the steam from top openings of the side chests and end chambers to the cylinder, and exhausting the same through the side

openings of the end chambers of the center chest, and exhaust-openings of the center chest, substantially in the manner and for the purpose specified.

RUFUS G. BISHOP.

Witnesses:

A. G. DRAKE,

D. M. BENDER.