2 Sheets—Sheet 1.

S. CURTIS.

BALANCED SLIDE VALVES.

No. 183,909. Patented Oct. 31, 1876.

Fig. 1.

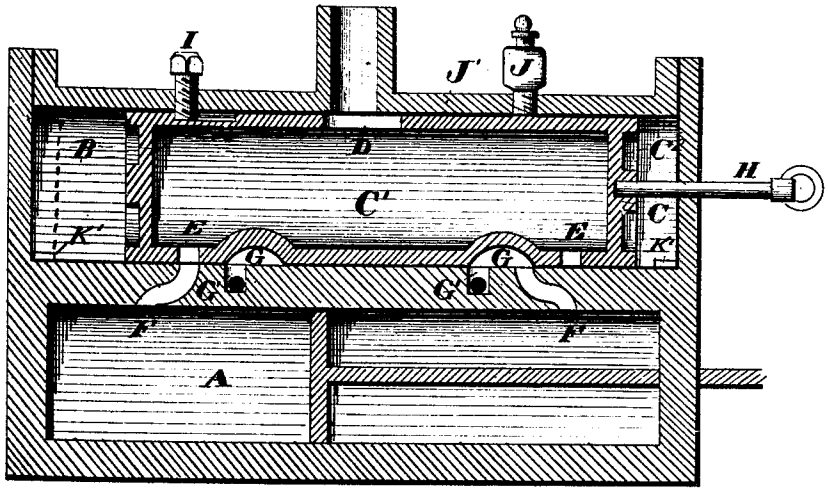
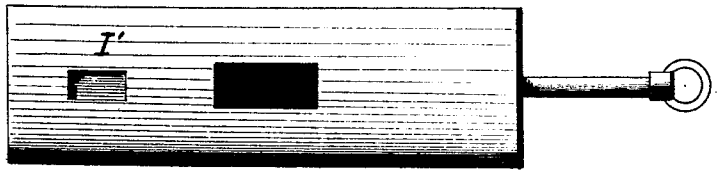


Fig. 2



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2 Sheets—Sheet 2.

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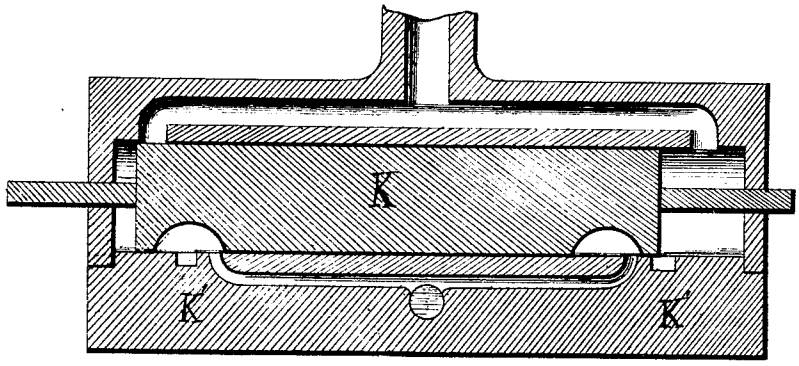

WITNESSES

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UNITED STATES PATENT OFFICE.

SAMUEL CURTIS, OF CLEVELAND, OHIO.

IMPROVEMENT IN BALANCED SLIDE-VALVES.

Specification forming part of Letters Patent No. **183,909**, dated October 31, 1876; application filed June 13, 1876.

To all whom it may concern:

Be it known that I, SAMUEL CURTIS, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Balance Slide-Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in balance slide-valves; and consists in a hollow double cylindrical valve, made to slide in the nature of a piston within a suitable cavity, and constructed to carry the steam always within it, substantially as hereinafter set forth and claimed.

In the drawing, Figure 1 represents a longitudinal central section through the said valve, showing parts in elevation. Fig. 2 represents a plan view of the same, the direction of the steam-conduits being indicated by dotted lines. Fig. 3 represents a vertical section of the auxiliary valve, and ports leading to and from the same.

A represents the locality of any cylinder. B represents the steam-chest or valve-chamber. C is the valve which forms the essential feature of my invention. The valve C is hollowed out at C^1, so as to carry the steam always within it, and permit it to emerge through either port E that may be open. E are the steam-ports, leading from the chamber C^1 in the valve C to the ports in the cylinder indicated at F. The valve C has a motion substantially to the extent indicated by the dotted lines at its ends. G are the bridges through which the exhaust is directed to the exhaust outlets or conduits G′. H is a handle, whereby the valve may be started in its motion manually when it is desired to start the engine.

It will be observed that this cylindrical valve C has a similar valve-opening, E, at each end thereof, and a similar bridge, G, so that it constitutes in fact a double valve.

It is also clearly apparent that, if desired to place the valve-openings E at a greater or less distance apart, it can be done by simply increasing or decreasing the length of the cylinder C, since its internal orifice C^1 always has the same under pressure direct from the boiler.

The operation of the valve will be clearly apparent to any person skilled in the art. The valve C has sufficient motion longitudinally to permit it to open the steam-port E at one end, while the exhaust-ports F and corresponding bridge G at the other end may be opened, and vice versa.

It is apparent that the orifice D, through which steam is admitted to the interior C^1, should be in area about equal to the area of the steam-ports E, so that thereby the valve will be balanced within the cylindrical cavity which it moves.

I is a set-screw or other suitable device, run down into a corresponding slot, I′, in the valve C. This serves to prevent a rotary motion of the valve C in its cylindrical cavity. J is an oil-cup, communicating with a slot, J′, in the valve C, whereby, if necessary, the valve C can be oiled. K is an auxiliary valve, which operates in connection with my valve, but which forms no essential part of my invention, the particular feature of my invention being the valve C, as hereinbefore described.

The auxiliary valve K serves to admit a cushion of steam in the front or rear respectively, of the valve C through suitable ports K′, which are so connected with the exhaust-outlets as to exhaust at the proper intervals.

The motion of the auxiliary valve may be governed in any suitable way, by connecting with the valve C or with other parts of the machinery, such connections forming no part of my invention.

The ends of the valve C are hollowed out at C^2, so as to admit a sufficient cushion of steam.

I have had this valve in successful operation for some time past, and find that practically it effects a great saving of steam, being direct in its action and very economical in its operation, and so simple in construction as to render it utterly impossible to get out of operation, and is readily adapted to cylinders of any desired length of stroke.

What I claim is—

The combination, with a cylinder provided with a set of widely-separated steam-ports, F, and exhaust-ports G′, of a cylindrical valve, C, closed at its ends, hollowed out at C^1, and provided with the inlet and outlet ports D E and the bridges G, substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAMUEL CURTIS.

Witnesses:

FRANCIS TOUMEY,

JAMES P. WALSH.