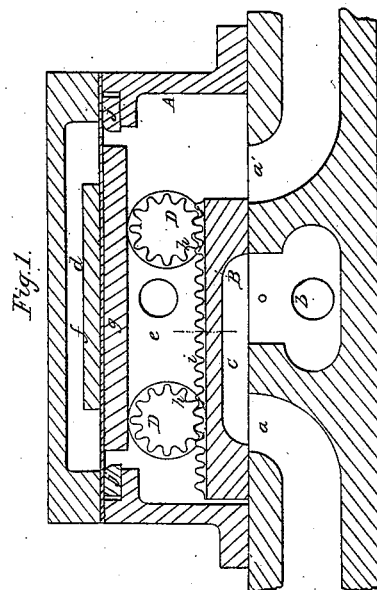
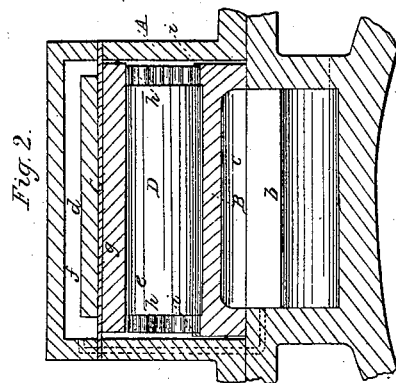


A. S. Cameron,
Steam Balanced Valve.

N^o 48,901.

Patented July. 25, 1865.



Witnesses
W. Reed Dorell
M. M. Lupton

Inventor
A. S. Cameron

UNITED STATES PATENT OFFICE.

A. S. CAMERON, OF NEW YORK, N. Y.

IMPROVEMENT IN BALANCED SLIDE-VALVES.

Specification forming part of Letters Patent No. 48,901, dated July 25, 1865.

To all whom it may concern:

Be it known that I, A. S. CAMERON, on the corner Twenty-Second street and Second avenue, in the city, county, and State of New York, have invented a new and Improved Balance Slide-Valve; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a longitudinal vertical section of this invention. Fig. 2 is a transverse vertical section of the same.

Similar letters of reference indicate like parts.

This invention relates particularly to slide-valves which take steam from below; and its object is to produce on the back of the valve a certain pressure somewhat stronger than the pressure which acts on the under side of the same, so that the valve is held on its seat with sufficient power to prevent its jumping or unseating.

The invention consists in combining with the valve one or more rollers and a diaphragm, which is exposed to the action of the steam and caused by the steam to bear on the rollers and to hold them down upon the back of the valve. The area of said diaphragm is so regulated that the pressure of the steam acting on it overbalances the pressure of the steam acting on the under side of the valve, and the valve is consequently held down on its seat with sufficient force to prevent it from jumping. In order to keep the rollers parallel on the back of the valve, they are provided with cogs at both ends, and these cogs gear in corresponding racks secured to the back of the valve, near its edges.

A represents the steam chest of an ordinary steam-cylinder, which takes steam through the channels *a a'*, and to which steam is admitted through the channel *b*.

B is the slide-valve, and the steam-channel *b* communicates with the ports *a a'* through the cavity *c* in the under side of the valve. In valves of this description the pressure of the steam has a tendency to throw the valve off from its seat, and it is therefore necessary to apply some device capable of holding the valve down without preventing it from traversing on its seat. I have effected this object by means of a diaphragm, C, which forms a partition in the valve-chest, dividing the same in two com-

partments, *d e*. The upper compartment communicates, by a suitable passage in the side of the valve-chest, with the steam-channel *b*, so that the upper surface of the diaphragm is exposed to the full pressure of the live steam. Said diaphragm is made of sheet metal or other suitable material, and it is strengthened by the plates *f g*, one on top and one below. The lower plate, *g*, bears on rollers D D, which rest on the back of the valve. These rollers are provided with cogs *h* at their ends, which gear in toothed racks *i*, secured to or formed in the back of the valve, near its edges, as clearly shown in Fig. 2 of the drawings. When the steam-pipe is opened and steam admitted to the channel *b* the upward pressure of the valve is counteracted by the downward pressure on the diaphragm, and the effective surface of this diaphragm is so regulated that the downward pressure of the same overbalances the upward pressure on the valve, and the latter is held on its seat with sufficient power to prevent leakage, and at the same time the whole is so arranged that the valve moves on its seat with the least possible loss by friction. Any increase or decrease in the pressure of the steam has no effect on the motion of the valve; and, if desired, the effective surface of the diaphragm can be made adjustable by means of the slides *j*, so that the same can be adjusted according to circumstances.

The cogs at the ends of the rollers keep the same parallel, and the pressure exerted by the diaphragm on the rollers is transmitted to the back of the valve with the least possible loss by friction.

The object of keeping the rollers parallel would be effected, however, by running connections from one to the other or by other equivalent means, and I do not wish to confine myself to the means shown in the drawings.

I claim as new and desire to secure by Letters Patent—

1. The combination of the diaphragm C, rollers D, and valve B, constructed and operating substantially as and for the purpose set forth.
2. The arrangement of cogs or their equivalents at the ends of the rollers and corresponding toothed racks on the back of the slide-valve, substantially as and for the purposes described.

A. S. CAMERON.

Witnesses:

WM. DEAN OVERELL,
M. M. LIVINGSTON.