W. B. Robinson,

Steam Balanced Valve.

No. 76,528. Patented Apr. 7, 1868

Fig. 1.

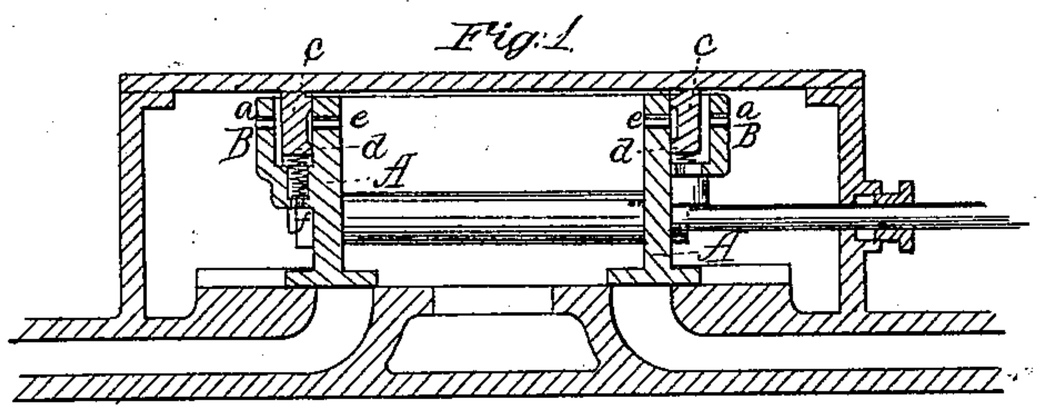


Fig. 2.

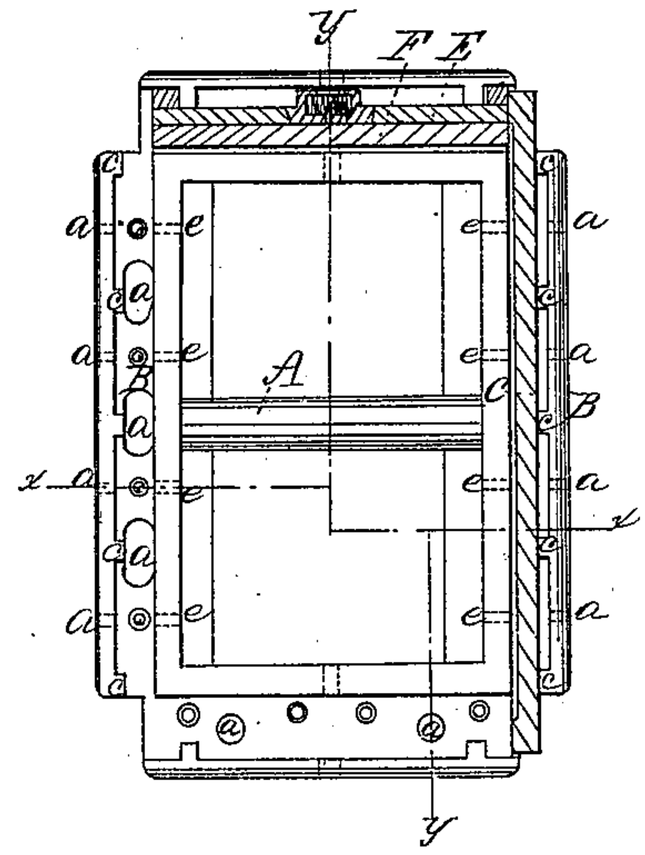
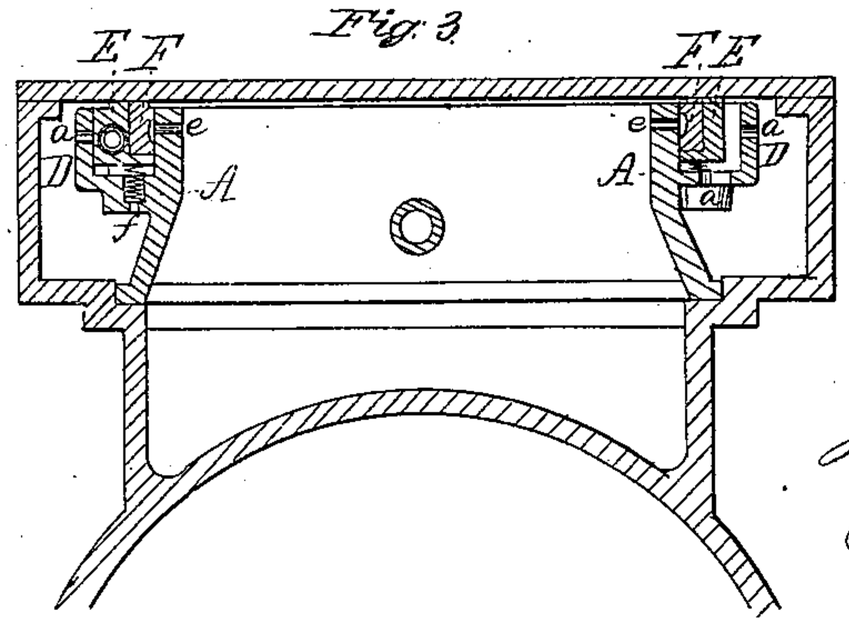


Fig. 3.



Witnesses

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WILLIAM B. ROBINSON, OF DETROIT, MICHIGAN.

Letters Patent No. 76,528, *dated April* 7, 1868.

IMPROVEMENT IN BALANCED SLIDE-VALVES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, WILLIAM B. ROBINSON, of Detroit, in the county of Wayne, and State of Michigan, have invented a new and improved Balanced Slide-Valve; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to a new and improved method of packing and balancing the slide-valves of a steam-engine, whereby the pressure of the steam on the face of the valve is counterbalanced and the valve allowed to have a free and easy motion; and the invention consists in providing packing-bars and strips of peculiar construction, in chambers which are provided with suitable apertures and recesses for the passage of the steam, in combination with springs, as will be hereinafter more fully described.

Figure 1 represents a vertical transverse section of the valve, and the parts connected therewith, through the line *x x* of fig. 2.

Figure 2 is a top or plan view of the valve with a portion of the packing-bars removed, showing the recesses in which they are secured, and the position of the spiral springs which operate upon them.

Figure 3 is a vertical longitudinal section of the valve, showing a cross-section of the end packing-strips, and of the L-shaped bars behind them, the section being through the line *y y* of fig. 2.

Similar letters of reference indicate corresponding parts.

The steam-chest, valve-rod, and a portion of the steam-cylinder are shown in red lines, for the purpose of showing the application of the valve to better advantage.

Recesses in the sides of the valve are formed for the reception of rectangular packing-strips, as seen in fig. 1.

The ends of the valve have recesses which contain, in addition to the same kind of packing-strips, L-shaped bars, in the rebated portions of which the packing-strips are placed, as seen in fig. 3.

A represents the valve, and B B represent the recesses on the sides of the valve.

C C represent the longitudinal packing-strips, which are placed loosely in the recesses, and are allowed to have free motion therein.

Beneath these strips C C there are spiral springs, *d*, or springs of other form, which serve to keep the strips and bars in position, and in contact with the top of the valve-chest.

The strips C C are recessed and rebated, as seen in the drawing, presenting differential surfaces, as seen, for steam-pressure.

The recesses B B are in free communication with the steam in the chest through the apertures or ports beneath the strips and in the side, as seen at *a a*, in the drawing. These recesses are ribbed, which ribs form guides for the strips, as seen at *c*, fig. 2.

From the interior of the valve there are apertures, *e*, which admit steam into the recesses in the strips C, as seen in the drawing.

The ends of the valve are packed by a similar arrangement, but the recesses D D, on the end of the valve, contain the L-shaped bars E E, before mentioned, the rebate of which contains and supports the packing-strips F F, which strips are in form (or in cross-section) the same as those on the sides of the valve.

The bars E, at each end of the valve, are in two pieces, in the ends of which pieces there are cavities, in which are placed spiral springs for forcing the pieces asunder, for the purpose of forming a steam-tight joint at their ends against the side packing-pieces C C, as plainly seen in fig. 2.

The springs *d*, at the ends of the valve, are seen bearing against the bars E instead of the strips F. The ports and apertures *a* and *e*, for the admission of steam into the recesses D D, are also seen in fig. 3.

In addition to the ports or apertures *a* through the bottom of the recesses D D and B B, there are orifices for the passage of steam into the cavities occupied by the spiral springs, or through the spiral-spring lugs, as seen at *f*, fig. 3.

The rebated bars E may be dispensed with, and the packing-strips F may lap by, or be arranged in any other suitable manner to form a steam joint with the side-strips at the corners of the valve.

It will be seen that the whole interior of a valve formed in this manner is a recess or chamber for the exhaust steam, which is considered an important advantage.

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

The balanced slide-valve, constructed as described, having the perforated side recesses B, adapted to receive the single packing-strip C, having differential surfaces, forming recesses, the inner recess communicating with the interior of the valve through the openings *e*, and the ends of said valve having perforated recesses, D, containing the double packing-strips, the inner one, F, of which is formed in one piece, and the outer one, E, of two pieces, held apart by the spiral spring, the recesses in the ring F also communicating with the interior of the valve through the openings *e*, all constructed, arranged, and operating as herein described, for the purpose specified.

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Witnesses:

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