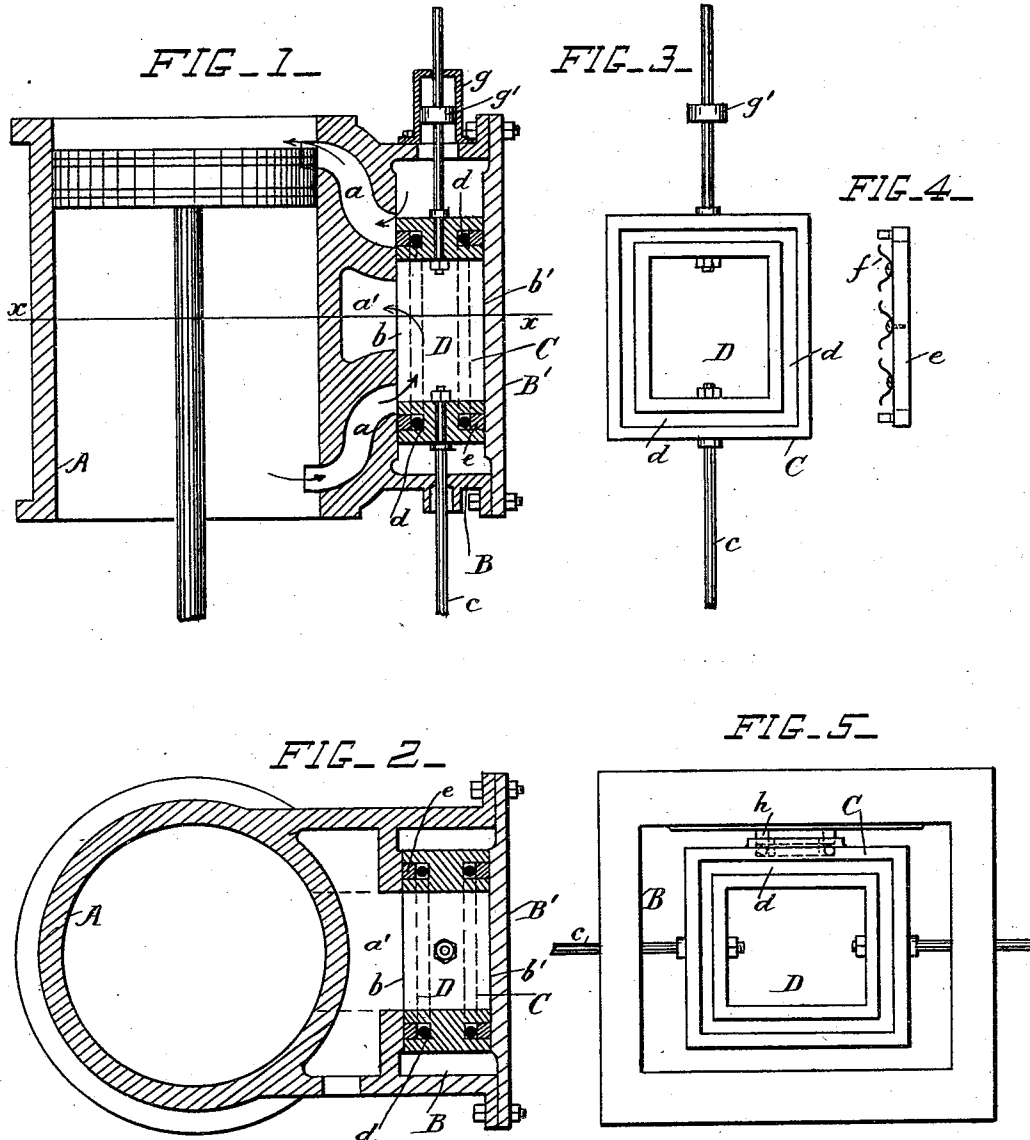


(No Model.)

C. G. WALLE.
SLIDE VALVE.

No. 478,829.

Patented July 12, 1892.



Witnesses

Walter Allen

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CARL G. WALLE, OF BROOKLYN, NEW YORK.

SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 478,829, dated July 12, 1892.

Application filed April 8, 1892. Serial No. 428,359. (No model.)

To all whom it may concern:

Be it known that I, CARL G. WALLE, a citizen of Norway, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in 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 appertains to make and use the same.

This invention relates to the slide-valves of steam-engines; and it consists in the novel construction and combination of the parts hereinafter fully described and claimed, whereby the slide-valve is balanced and works back and forth between the steam-chest faces without friction.

In the drawings, Figure 1 is a longitudinal section through a steam-cylinder provided with a slide-valve according to this invention. Fig. 2 is a cross-section through the same, taken on the line *x x* in Fig. 1. Fig. 3 is a detail front view of the slide-valve. Fig. 4 is a detail side view of the slide-valve packing. Fig. 5 is a front view of a horizontal slide-valve and steam-chest.

A is the cylinder, which is of any approved construction, and is provided with steam-ports *a* and an exhaust-port *a'*.

B is the steam-chest, and B' is the steam-chest cover.

C is the slide-valve, which works steam-tight between the faces *b* and *b'* on the cylinder and steam-chest cover, respectively.

The valve C is provided with a valve-rod *c* for reciprocating it in the ordinary manner. The valve C is rectangular in shape and is provided with an exhaust-chamber D, extending clear through it. The steam is admitted and exhausted through the ports in the face *b*, as indicated by the arrows in Fig. 1. As the opposite sides of the valve are equal in area, the valve is balanced and works free from friction between the faces *b b'*. The valve is provided with a rectangular groove *d* in each working face, and *e* is the packing, which consists of a hollow rectangular frame which fits the groove *e*. The packing is held against the faces *b b'* by springs inserted in the grooves *d* behind it. Steel springs *f*, as

shown in Fig. 4, may be used, or india-rubber or composition springs, as shown in Fig. 1. The weight of the valve and the moving parts attached to it are preferably balanced by the pressure of the steam in the steam-chest. When the valve works in a vertical plane, as shown in Fig. 1, a small auxiliary cylinder *g* is secured on the upper end of the steam-chest. A piston *g'* slides in the cylinder *g* and is connected to the valve by a rod. When the valve slides in a horizontal plane, as shown in Fig. 5, an auxiliary cylinder and piston can also be used; but the rod connecting the auxiliary piston to the slide-valve must be pivoted at each end. In either case the auxiliary piston has its area proportioned, so that the pressure of the steam against it will balance the weight of the valve.

Fig. 5 shows another means for balancing the weight of the valve. This consists of a hollow rectangular frame *h*, provided with springs and let into a rectangular groove in the upper side of the slide-valve. This frame *h* is pressed by its springs against the face *h'* on the upper side of the steam-chest, and the size of the rectangular frame is such that the area of the upper side of the valve against which the steam presses is less than the area of the lower side of the valve by the amount necessary to balance the weight of the valve by the additional pressure of the steam beneath it.

What I claim is—

1. The combination, with a cylinder provided with ports and a steam-chest having parallel faces, of a slide-valve working between the said faces and having its opposite sides of equal area, and spring-pressed packing-frames let into the working faces of the said valve, substantially as set forth.

2. The combination, with a cylinder provided with ports and a steam-chest having parallel faces, of a slide-valve working between the said faces and having an exhaust-passage extending through it, and spring-pressed packing-frames let into grooves in the working faces of the valve around the said exhaust-passage, substantially as set forth.

3. The combination, with a cylinder provided with ports, and a steam-chest having

parallel faces, of a slide-valve working between the said faces and provided with a compensating device whereby the weight of the valve is balanced by the pressure of the steam in the steam-chest, and spring-pressed packing-frames let into the working faces of the said valve, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CARL G. WALLE.

Witnesses:

HANS THORSON,
JOHN HANSEN.