(No Model.)

J. J. DE LANCEY.

BALANCED SLIDE VALVE.

No. 261,688. Patented July 25, 1882.

Fig. 1

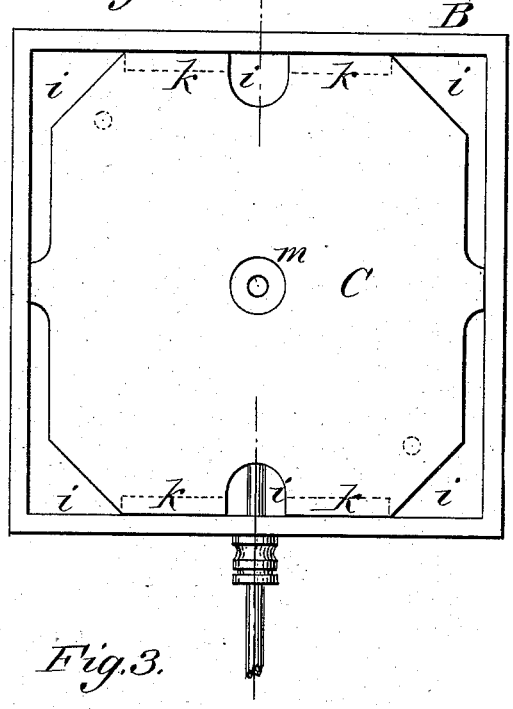


Fig. 2.

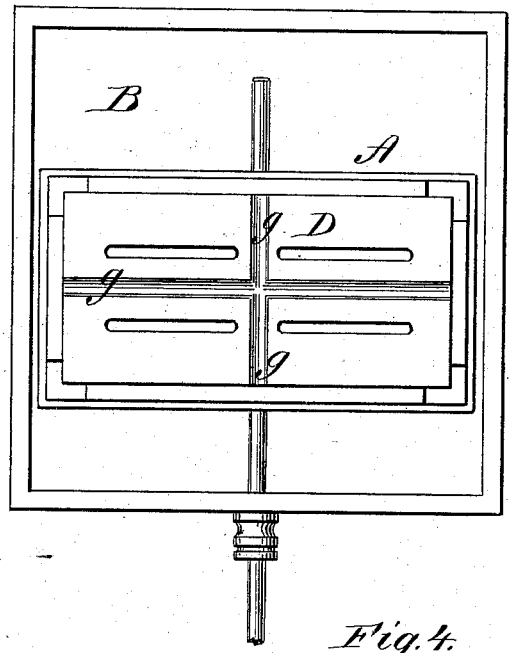


Fig. 3.

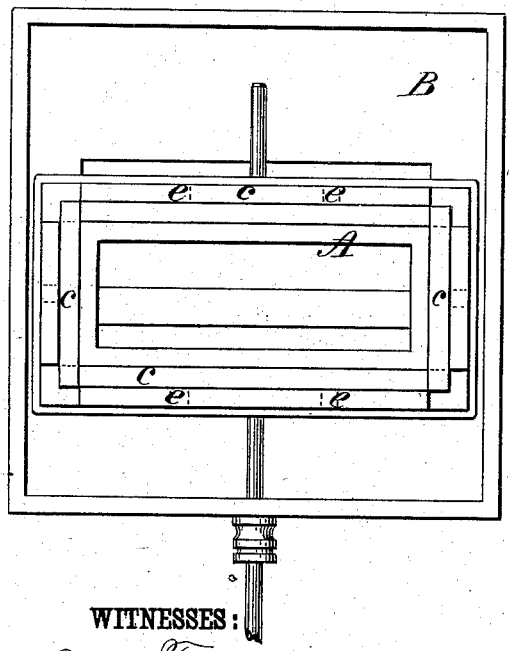


Fig. 4.

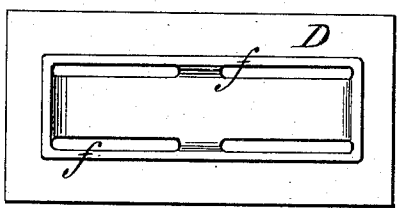
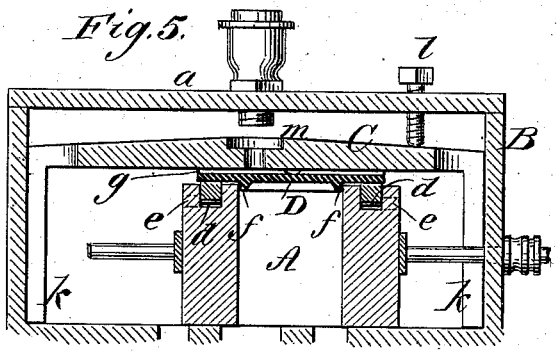


Fig. 5.



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JOHN J. DE LANCEY, OF BINGHAMTON, NEW YORK.

BALANCED SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 261,688, dated July 25, 1882.

Application filed April 27, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. DE LANCEY, of Binghamton, in the county of Broome and State of New York, have invented a new and useful Improvement in Balanced Slide-Valves, of which the following is a full, clear, and exact description.

My invention relates to that class of slide-valves that are fitted to work beneath a face-plate placed in the steam-chest.

My present invention relates to improvements on the slide-valve patented to me June 20, 1876, No. 179,002; and it consists in certain features of construction and arrangement whereby the operation of the valve is rendered more effective and excessive wear prevented, as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of steam-chest containing the improved valve, the cover of the chest being removed. Fig. 2 is a plan view, with the face-plate removed from the chest, showing the balance-plate of the valve. Fig. 3 is a plan view of the valve with the balance-plate removed. Fig. 4 is an inverted plan view of the balance-plate. Fig. 5 is a transverse section of the valve in the steam-chest with the parts in position.

A is the valve, which is made hollow, of rectangular form, and with perpendicular faces on both its inner and outer sides. B is the steam-chest, having a movable cover, *a*. C is the face-plate fitting in the steam-chest above the valve, and D is a slotted balance-plate upon the valve and beneath the face-plate.

The upper edges of the valve A are formed with longitudinal grooves, that receive the packing-bars *c*, these bars being connected at each corner by square lap-joints, so that the longer side bars support the shorter end bars, and beneath these packing-bars are plate-springs *d d*, that act to press the packings outward. The packing-bars *c* are made square in cross-section, so that the steam will have equal surfaces to act upon at each side, and so that the springs will operate the same under pressure as they do without the pressure on a seat or face-plate that is worn out of surface.

In the sides of the valve A are apertures *e e* for admission of steam beneath the packing-bars. The balance-plate D is in steam-tight contact with the packing-bars *c* and with the face-plate C above. It is formed with flanges *f* on its under side, that fit loosely within the valve A, and this plate is of such size that its outer edges are in line, or nearly so, with the outer edges of the packing-bars *c;* but in case more friction is desired this plate D may project over the edges of the packing-bars. The upper surface of the balance-plate is formed with longitudinal and transverse oil-grooves *g g*, and the surface of such grooves is made to equal the surface of the packing-bars beneath the plate, the object being to insure exact balance of the plate under any steam-pressure, and to prevent friction between the balance-plate and the face-plate, except what may be due to the upward pressure of the springs of the packing-bars.

The face-plate C fits closely in the steam-chest, with the exception of openings *i*, that are provided to allow free circulation of steam in the chest. The plate is supported by rests *k k*, that are cast upon its under side and take upon the valve-seat or bottom of the chest; or they may be supported by lugs cast upon the inner surface of the chest. Set-screws *l* in the steam-chest cover serve to hold the face-plate down. When the valve wears or is faced down the face-plate is correspondingly adjusted by reducing the length of the rests *k*.

For oiling the valve the recess *m* is formed in the upper surface of the face-plate, and a small aperture, *n*, is made through the plate at its center and beneath an oil-cup in the steam-chest cover. The oil will pass through the opening *n* to the oil-grooves in the balance-plate D, and by these grooves be distributed over the contact-surfaces.

The object in constructing the valve with perpendicular faces is to allow the removal of all pressure from the valve except what is necessary to keep it down on its seat when the port is covered and the cylinder full of steam. The square form of the packing-bars facilitates the movement of the packing up and down by the springs in cases where the valve-seats and face-plates are worn unequal. With packings having a less face than depth, the pressure by

the face-plate which holds them downward being upon the narrowest face and the steam-pressure upon the wider face, they may be held down by the steam-pressure, instead of rising to the hollows in the face-plate. By the use of the rests cast with the face-plate the adjustment of the plate to the valve is much facilitated, as the rests have simply to be planed off to correspond with the reduction in the depths of the valve.

It will be understood that the balance-plate D moves with the valve, its object being to obtain a broader wearing-surface without increase of pressure; and it is to be observed that there is no pressure on the balance-plate except what is given to it by the packing, and if that is found to be excessive it can be reduced by increasing the exposed surface of the oil-grooves; but in no case should the surface of the oil-grooves be greater than the surface of the packing. These oil-grooves insure complete lubrication of the friction-surfaces.

The slots in the balance-plate are to allow the escape of steam to the exhaust-cavity in case the facings become worn sufficiently to allow the steam to blow through. Further, by using this balance-plate the packings are entirely preserved from wear, so that when once fitted it will not be necessary to renew them.

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

1. The balance-plate D, formed with flanges and oil-grooves, as shown and described, in combination with the slide-valve A, face-plate C, and steam-chest, substantially as described.

2. The balance-plate D, formed with flanges and oil-grooves, in combination with a slide-valve provided with spring-actuated packing-bars *c*, and the face-plate C, substantially as described, and for the purpose set forth.

3. In slide-valves, the balance-plate D, fitted for movement with the valve, and formed with oil-grooves upon its upper side, in combination with face-plate C, having a central aperture, *m*, substantially as shown and described.

4. The combination of the slide-valve A, formed with perpendicular faces, the square packing-bars *c*, fitted in grooves in the upper edges of the valve, the balance-plate D, provided with oil-grooves upon its upper side, and the face-plate C, supported by the rests *k*, all substantially as described, for operation as set forth.

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