

J. J. De LANCEY.
BALANCED SLIDE-VALVE.

No. 179,002.

Patented June 20, 1876.

Fig. 1

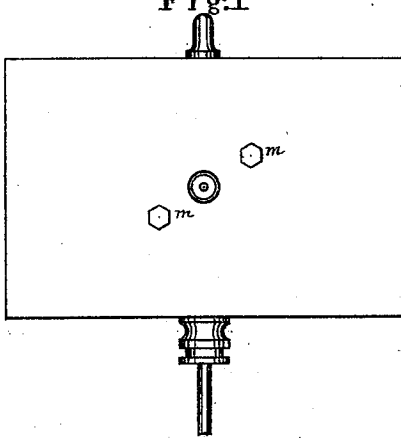


Fig. 3

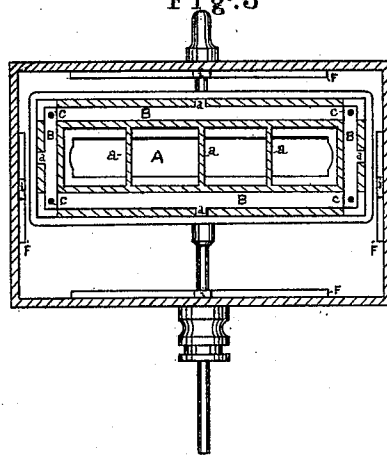


Fig. 2

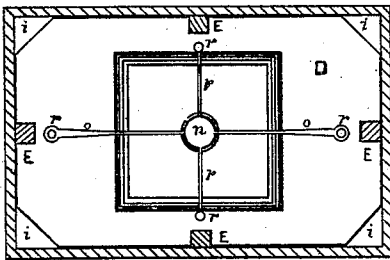


Fig. 4

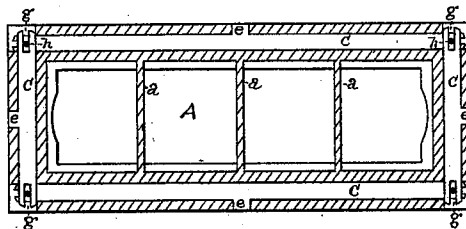


Fig. 7

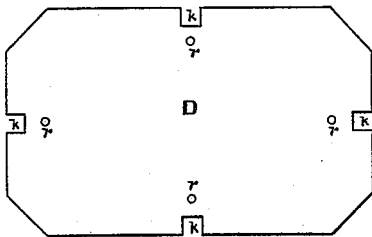


Fig. 5

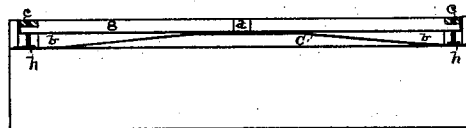


Fig. 6

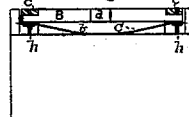


Fig. 8

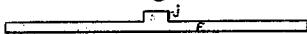


Fig. 9

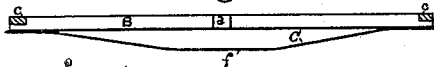
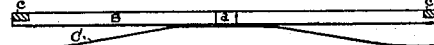


Fig. 10



Witnesses
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UNITED STATES PATENT OFFICE.

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

IMPROVEMENT IN BALANCED SLIDE-VALVES.

Specification forming part of Letters Patent No. **179,002**, dated June 20, 1876; application filed April 24, 1876.

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 Anti-Friction Slide-Valves for Steam-Engines, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

My invention relates to that class of anti-friction valves in which the upper surface of the valve works in steam-tight contact with a face-plate in the steam-chest, the object of the invention being the construction of a valve that shall be more effective and less liable to derangement than others now in use, and that, when required, shall facilitate the removal of the valve from the steam-chest.

My invention consists in a new construction and arrangement of parts, which will be hereafter fully explained.

Figure 1 in the accompanying drawings is a top view of a steam-chest embodying my invention. Fig. 2 is a plan of the same with the chest-cover removed, showing the top of the face-plate in position. Fig. 3 is a plan of the valve and connections in position with the face-plate removed, showing the projecting lugs upon which the plate is supported. Fig. 4 is the valve removed from the steam-chest, with the packing-bars removed, showing the springs in position, the manner of their connection, and the valve-port. Fig. 5 is a side elevation of the valve, having an outside section of the packing-grooves removed, showing one of the side springs and packing-bar in position, also the plain surface of the side of the valve. Fig. 6 is an end view of the same, showing the end packing-bar and spring, and the manner of connecting the packing-bar. Fig. 7 is an inverted view of the face-plate. Fig. 8 is one of the adjusting-bars removed. Fig. 9 represents one of the side packing-bars with the spring bearing at each end of the bar. Fig. 10 is the same with the spring bearing on its flattened center, for the purpose of showing that it may be used in either position.

A is the valve, which has a skeleton top connected by transverse ribs *a*. This skeleton top obviates the usual pressure on the valve, with the exception of that required to main-

tain a steam-tight contact with the valve-seat when the port is covered and the cylinder full of steam. The sides and ends of the valve have plain perpendicular surfaces, which allows it to be made broader and deeper than the ordinary valve, on account of the usual projecting face, by which means a larger exhaust-cavity may be used; and when it is required to remove the valve from the steam-chest, it may be accomplished by simply removing the cover and taking the valve from the yoke, while, by the ordinary method, the entire steam-chest has to be removed.

The upper edges of the valve A have longitudinal and transverse grooves *b*, for the packing-bars B, which are made square. This allows of a broader bearing on the face-plate than the ordinary rectangular or flattened bar, which is liable, by its unequal sides to catch against the sides of the grooves *b*, by the pressure of the steam, and prevent its free movement, while a bar having equal sides presents the same surface for the steam to act upon on each of its sides. These bars are connected by a square lap-joint, *c*, on each corner, the long bars supporting the short ones, which secures an equal bearing against the face-plate until worn out. From the outside and center of each bar there is a projecting lug, *d*, which works in the slot *e*, made in the outside of the groove *b*. These lugs carry the bar separate and independent of the joints *c*, which prevents the bar from changing its relative position with the face-plate, which obviates the usual wear at the points of contact. U C are elliptic platform-springs, which work in the grooves *b*, under the packing-bars B, and may have their bearings on the end of the bars or on a flattened surface, *f*, in the center, as shown by Figs. 9 and 10 in the drawings. The ends of these springs have slots *g*, which work astride safety-pins *h* in the corners of the valve. These pins enter a hole in the ends of the long bars B, which prevents the escape of any part of the spring if it should break.

The two long springs are all that is required to keep the packing up, and the two short ones are simply for safety in case the long ones should break.

D is the face-plate, which is fitted closely in the steam-chest, with the exception of trian-

gular openings *i* at each corner for a free circulation of steam in the chest. This face-plate has its bearing on four projecting lugs, *E*, from the inside of the steam-chest, and takes the full pressure of the valve, by which means the usual attachment to the chest-cover is obviated, and a more satisfactory adjustment secured. Between these lugs and the face-plate are four adjusting-bars, *F*, which have projections *j* from the top and center, which enter notches *k* in the face-plate, which holds them securely in position.

When the valve wears or is faced down, the face-plate is adjusted to its position with the valve by reducing the thickness of the bars *F*, and when the face-plate has been faced off, the screws *m* in the cover are turned down to the required distance to hold it in position. These screws also secure the plate in place when the throttle is first opened.

For oiling, a recess, *n*, is made in the face-plate directly under the oil-cup, from which recess the oil passes through channels *o p* to oil-holes *r* in each of the four sides of the face-plate. It is then distributed over the long packing-bars when the valve is at its extreme travel, and over the short bars without intermission.

I am aware that packing-bars, similar, in some respects, to those described as my invention, have long been in use, and that a patent was granted to G. W. Richardson for an improved slide-valve, dated January 31, 1871, having wide packing-bars connected by abutting the ends of the long bars against the

sides of the end bars, and working independently of each other. I therefore disclaim the use of the packing described in said invention, or in any other similar arrangement, and confine myself to the construction and connection of the packing-bar *B* and the other devices herein described. The face or balancing plate *D* is supported independently of the ordinary screws in the steam-chest, which allows of a more accurate and ready adjustment of the packing than can be accomplished when suspended in the ordinary manner.

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

1. The plane or flat sides of the valve *A*, to allow a ready removal from the steam-chest, in combination with the square packing-bar *B*, provided with central lug *d* working in slot *e*, and connected by lap-joint *c*, slot *g*, in the end of springs *C*, and safety-pins *h*, substantially as described.

2. The face or balancing plate *D*, fitting closely in the steam-chest, with openings *i* in corners, lugs *E*, for supporting the plate in position, adjusting-bars *F*, having projection *j*, fitting into notches *k* in the face-plate, oil-recess in the face-plate, channels *o p* to oil-holes *r*, and set-screws *l m*, all constructed and arranged substantially as herein described, for the purpose set forth.

JOHN J. DE LANCEY.

Witnesses:

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