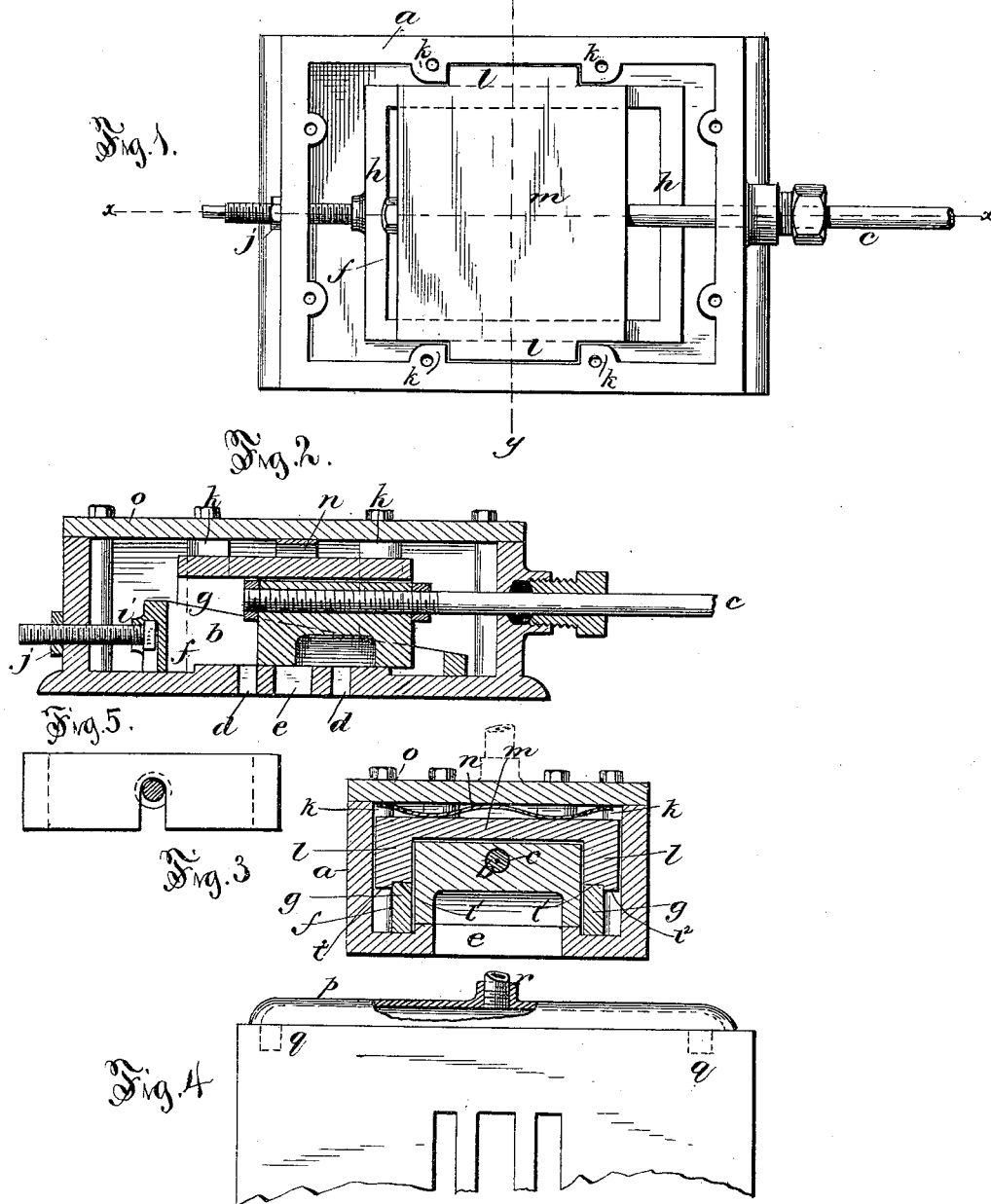


(No Model.)

W. H. WHEELER.  
BALANCED SLIDE VALVE.

No. 348,254.

Patented Aug. 31, 1886.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

WILLIAM H. WHEELER, OF YORK, PENNSYLVANIA.

## BALANCED SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 348,254, dated August 31, 1886.

Application filed April 12, 1886. Serial No. 198,606. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. WHEELER, a citizen of the United States, residing at York, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Balanced Slide-Valves, of which the following is a full, clear, and exact description.

The object of this invention is to effectively balance slide-valves, and to have the balancing means under such ready control from outside the valve-case or steam-chest that compensation for wear or looseness of the valve, and consequent leakage of steam, may be corrected at once.

The invention consists in balancing means for slide-valves, comprising an inclined yoke freely surrounding the valve, and having a set-screw projecting through the valve-case, whereby the position of the said yoke may be varied at pleasure to raise or lower a balancing-plate with relation to the valve, said plate having inclined side pieces which rest upon the inclined yoke, which said side pieces work in guides on the valve-shell, all and severally, as I will now proceed to fully set forth and claim.

In the accompanying drawings, in the several figures of which like parts are similarly designated, Figure 1 is a plan view with the cover removed. Fig. 2 is a vertical section in the plane of line *x x*, Fig. 1. Fig. 3 is a vertical cross-section in the plane of line *y y*, Fig. 1. Fig. 4 is a side elevation of part of steam-chest for a valve for a stationary engine; and Fig. 5 is a detail of yoke, showing swiveling of its adjusting-screw.

The mechanism shown in Figs. 1, 2, and 3 may represent an ordinary locomotive-engine slide-valve having the rectangular case *a* and ordinary D-valve *b*, with its stem or valve-rod *c*, and ports *d d* and exhaust *e*. Loosely or freely surrounding the valve *b* is a yoke, *f*, having the inclined or wedge-like sides *g*, which are connected at both ends by cross-pieces *h*, the sides and cross-pieces being, if desired, cast together, and afterward finished in any ordinary manner. This yoke is adjustable lengthwise by means of a set-screw, *i*, swiveled to one end of it, and engaging a screw-thread in or applied to the valve-case. I prefer to provide this set-screw with a squared

end, so as to be operable by a wrench, and in order to prevent tampering with its adjustment I provide a lock-nut, *j*, or, if desired, apply a padlock or other sealing device to it.

At the ends of the ports on the side walls of the shell I provide guides *k*, (shown as vertical cleats,) and in these cleats are fitted the side pieces, *l*, of the balance-plate *m*. The lower ends of these side pieces on the side next the valve are inclined or beveled, as at *l'*, to match the incline of the sides of the yoke *f*, while the said side pieces on the side next the walls of the steam-chest are straight, as at *l''*, and embrace the outer faces of the sides of the yoke to steady and guide its movement. These side pieces of the balance-plate fit to and guide the valve in its motion. The balance-plate is of sufficient area to cover the stroke of the valve, and it is kept pressed upon the valve with a sufficiently strong pressure by a spring or springs, *n*, interposed between the shell-cover *o* and the valve *b*. The proper relative position of the balance-plate with respect to the valve is maintained by adjusting the yoke, the inclined sides of which, acting upon the inclined ends of the side pieces of the balance-plate, serving to adjust said plate with respect to the valve. It will be observed that the yoke is adjusted perfectly by one screw, whereas, in all other balance-valves to me known equivalent devices have required at least four screws for the same purpose, and, as will be readily understood, each side had to be adjusted separately from each end, and consequently the uniform and equal adjustment of the two side wedges or inclines was practically impossible. Again, the balance-plate having the side pieces working in guides is always insured against displacement, or, in other words, is always brought accurately into position.

Steam is admitted to the valve in the ordinary manner.

In a valve for stationary engines supplied with my improved balancing means (see Fig. 4) the case or shell is provided with a half-round steam passage-way, *p*, having inlets *q q* and a steam-pipe, *r*, between them. Similar provision for admitting steam to the locomotive-valve, Figs. 1 and 2, may be employed in the cover *o* of the valve.

I desire to lay stress upon the fact that with

my balancing means the adjustment is always positive and accurate, and the balancing-plate is always and automatically trued. Heretofore, so far as I am aware, this has not been possible with the four-screws construction or devices employed. It will be observed also that with my construction the balancing-plate cannot jump under excessive pressure.

It will be observed that the balance-plate does not extend from end to end of the valve-case; hence there is greater steam-space within the case.

I am aware that heretofore a cut-off valve has contained in one steam-chest a D-valve surrounded by a wedge-like yoke, which latter was adjusted by a single screw to raise and lower a cap superposed upon the D, and containing two cut-off valves and ports therefor, and borne upon by a spring. This cap has had lateral ribs fitted in grooves in the side walls of a steam-chest, and said cap has rested upon the wedge-like yoke, and was adjusted relatively to the D by movement of the yoke. The steam-chest also contained a rock-shaft, and two cranks connected by links to the cut-off valves. Obviously this cap could not serve as a balance-plate at all times, for the reason that the cut-off gear could not adjust itself practically to the varying height of the cap without working hard and becoming distorted. In my invention the plate *m* is a balance-plate, pure and simple.

What I claim is—

1. In a slide-valve, a D-valve, the yoke having inclined sides and freely surrounding the valve, and a single adjusting-screw for positively moving said yoke in either direction and retaining it in such adjustment, combined with the balance-plate *m*, having side pieces, *l*, provided with inclined ends *l'*, resting upon said inclined sides of the yoke, and straight portions *l''*, embracing the sides of said yoke, and guides for said side pieces, the said side pieces also embracing the valve, substantially as described.

2. A slide-valve comprising a steam-chest, a D-valve, a yoke having inclined sides and freely surrounding the valve, and a single adjusting-screw for positively moving said yoke in either direction and retaining it in such adjustment, combined with the balance-plate *m*, having the side pieces, *l*, embracing the valve, and provided with inclined ends *l'*, resting upon said inclined sides of the yoke, and straight ends *l''*, embracing the sides of the yoke, and guides for said side pieces, and a spring or springs to seat said balance-plate upon the yoke, substantially as described.

In testimony whereof I have hereunto set my hand this 10th day of April, A. D. 1886.

WILLIAM H. WHEELER.

Witnesses:

W. BATZEL,  
JONATHAN JESSOP.