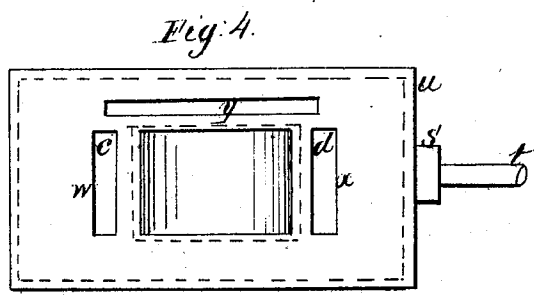
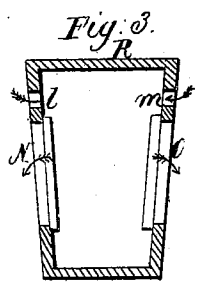
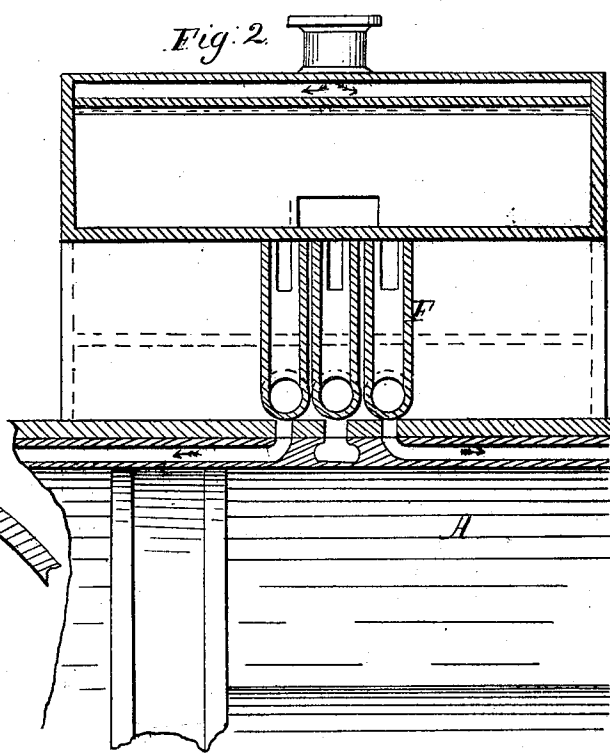
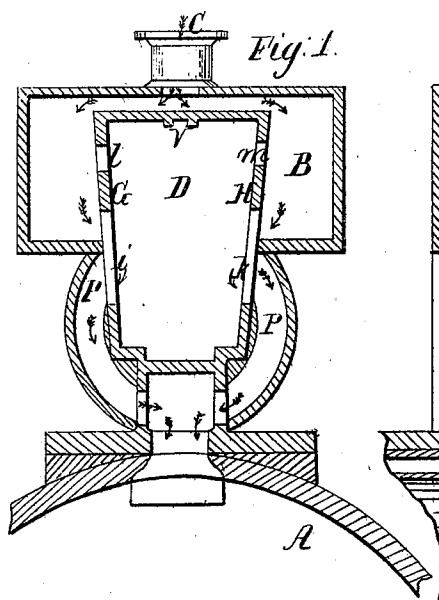


*A. Streber*

*Balance Slide Valve.*

*N<sup>o</sup> 93,133.*

*Patented Jul. 27, 1869.*



*Witnesses;*  
*William Baker.*  
*Pierpont Barton*

*Inventor,*  
*Antoine Streber*

# UNITED STATES PATENT OFFICE.

ANTOINE STEBER, OF UTICA, NEW YORK.

## IMPROVED BALANCE SLIDE-VALVE.

Specification forming part of Letters Patent No. 93,133, dated July 27, 1869.

*To all whom it may concern:*

Be it known that I, ANTOINE STEBER, of the city of Utica, in the State of New York, have invented a new and useful Balance Slide-Valve for Steam-Engines; and I do hereby declare that the following is a full and exact description of the construction and operation thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The object of my invention is to relieve the valve from the effect of the pressure of steam up it and effect an easy movement of the same, and I do this by providing a box to stand within the steam-chest in front of the cylinder, being constantly supplied with steam from the surrounding steam-chest, in the manner hereinafter described.

To further illustrate this arrangement, I refer to the annexed drawings.

Figure 1 is a cross-section of the apparatus referred to. A is an end view of a fragment of the cylinder, and the remainder of the figure shows the valve arrangement attached thereto. B is the steam-chest, into which the steam enters from the boiler through the nozzle C. D is the inclosing box, into which the movable valve-box, with duplicate valves, is inserted, and within which it moves. R, Fig. 3, is a cross-section of this valve-box, which is fitted to move within the cavity D. (Shown in Fig. 1.) The sides N and O of this box each constitute a slide-valve, moving upon the opposite plane, G and H, Fig. 1, opening and closing simultaneously the perpendicular apertures *i* and *k* for the passage of the steam to and from the cylinder, in the usual manner, the steam-chest B always supplying the interior of the valve-box with full pressure of steam through the longitudinal orifices *l* and *m*, Figs. 1 and 3, which are never closed, while the perpendicular ports (represented by the spaces *i* and *k*, Fig. 1) are alternately opened and closed by the movements of the valves in the usual manner, the apertures for escape of the steam on each side of the valve-box being alike opened and closed at the same time, the steam passing to the cylinder by the circuitous passages P P on each side of the box, as indicated by the

arrows. The movement is the same as that of the slide-valves in common use, except that the valves and passages are here duplicated. Thus the pressure of the valve upon the face of the cylinder is neutralized and wholly removed. A perfect contact of the face of the valves and the face abraded by it is maintained by reason of the valve-box R, Fig. 3, and the corresponding cavity D, Fig. 1, in which it moves, being wedge-shaped, or narrower at the bottom than at the top, as shown in the drawings. The weight of the valves secures a constant contact, and its motion under slight but constant pressure makes a perfect fit. For the purpose of self-adjustment of the valves when in operation, the base S, Fig. 4, of the valve-rod *t* is attached to the end plate of the valve-box *u* by a loose dovetailed plate let into the end plate and capable of self-adjustment in a vertical direction when in action; and also, to promote a steady and a uniform close joint of the valve-surfaces, a spring may be inserted between the head of the valve-box R, Fig. 3, and the roof of its inclosure, resting in the groove V, Fig. 1, and pressing gently on the top of the valve-box.

Fig. 2 is a longitudinal section of the apparatus just described, with a side view, A, of the cylinder below. This figure discloses a view of one of the inside faces of the inclosing valve-box D, Fig. 1, showing at F the usual arrangement of the steam-ports operated upon by the movement of the valves. This arrangement does not differ from that in common use, except that what is here shown is duplicated, as before described, and is the same on both sides of the valve-box.

Fig. 4 is a longitudinal side view of the movable valve-box, showing one of the two equal opposite sides with the valve arrangement. This face arrangement, as seen from W to X, is similar to the face of the ordinary slide-valve, the opposite sides of the box being precisely similar to that here seen. In addition to this ordinary valve arrangement, the figure shows the aperture Y. This is the inlet for the steam from the steam-chest to the interior of the valve-box, and is alike on both sides of the box. These apertures are never

closed, while the apertures *e* and *d* are alternately opened and closed by the movement of the valve in the usual way.

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

The hollow slide-valve R, with ports I *m i*

K, seat D, and steam-chest B, constructed and arranged with reference to each other substantially as described.

ANTOINE STEBER.

Witnesses:

WILLIAM BAKER,  
DEXTER GILLMORE.