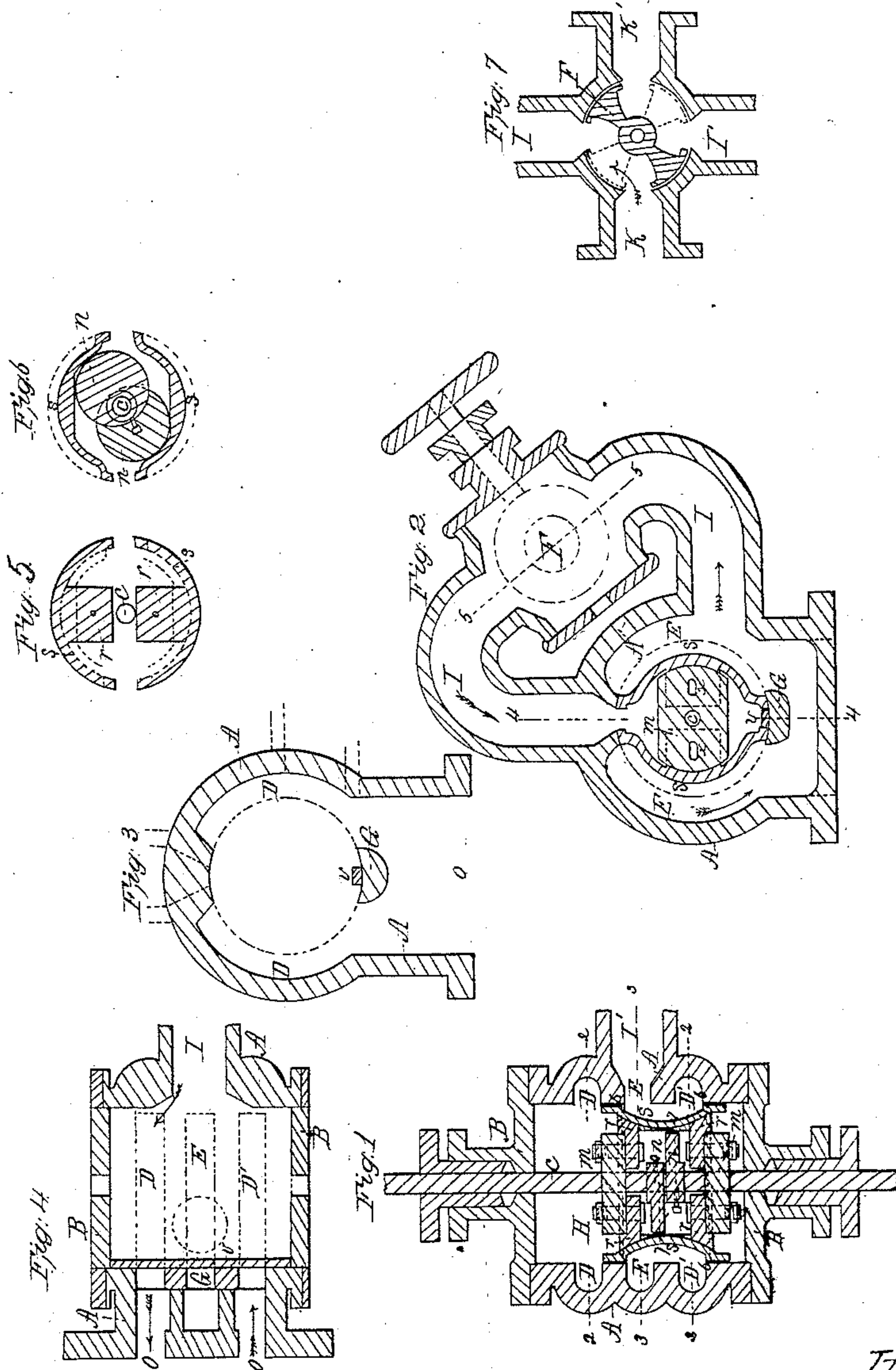


*Everitt & Cook,*

*Steam Balanced Valve.*

*N<sup>o</sup> 84,054.*

*Patented Nov. 17, 1868.*



*Witnesses*  
*W. G. Kitch*  
*George Gary*

*Inventor*  
*John S. Everitt*  
*Osman Cook*



# United States Patent Office.

JOHN S. EVERITT AND OSSIAN COOK, OF OSHKOSH, WISCONSIN.

Letters Patent No. 84,054, dated November 17, 1868.

## IMPROVEMENT IN STEAM-ENGINE SLIDE-VALVES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that we, JOHN S. EVERITT and OSSIAN COOK, of the city of Oshkosh, county of Winnebago, and State of Wisconsin, have invented a new and improved Balance-Slide Valve for Steam-Engines, with an attachment for reversing motion ; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a horizontal section of steam-chest and valve.

Figure 2 is a vertical cross-section, cutting through the dotted line 3 3, fig. 1, with reversing-valve and pipe attached.

Figure 3 is a vertical cross-section, cutting through the dotted line 2 2

Figure 4 is a vertical longitudinal section, cutting through dotted line 4 4, fig. 2.

Figure 5 is a vertical cross-section, cutting through dotted line 6 6, of valve H, fig. 1.

Figure 6 is a vertical cross-section, cutting through dotted line 7 7, of valve H, fig. 1.

Figure 7 is a cross-section of reversing-valve, cutting through dotted line 5 5, fig. 2. This valve operates also as a throttle-valve.

H, in fig. 1, is a horizontal section of balance-valve.

A A is the shell of the steam-chest or valve-case.

B B are steam-chest heads.

C is the valve-stem.

D D, D' D', E E, are steam-ports.

F, figs. 2 and 7, is a combined throttle and reversing-valve.

G, figs. 2 and 4, is a bridge in the bottom of valve-case, and *v* is a spline that serves to secure the valve from an oscillating motion, and confines it strictly to a longitudinal motion.

O O', fig. 4, are injection and ejection-passages.

*m m*, fig. 1, are arms, secured to the valve-stem C, and have slots *x x*, seen in fig. 2.

S S are valves, with lugs *r r*, by which S S are adjustably connected to arms *m m*, with bolts, as seen in fig. 1.

*n n* are cams, attached by set-screws to and slide on the valve-stem C, as seen in fig. 6, and serve to adjust the valves, pressing them out as they become worn, and thus keep the valve well fitted to its seat.

I I' are injection and ejection-pipes, connecting the throttle and reversing-valve F with the balance or main valve H.

K is a supply, and K' is an exhaust-pipe.

Our invention consists in the construction of a slide-valve, that is hollow, and with bores, in a known form, on the outside, the one opposite the other, so that the pressure on either side balances that of the other, the same to be constructed separately, the one from the other, and adjustably connected to the valve-stem, so that as they become worn they may be adjusted through suitable cams, and made to fill the valve-chest, and fit the valve-seat, thus compensating for wear.

Our invention further consists in the arrangement of the hollow balance-slide valve, and the reverse and throttle-valves, when provided with a steam-chest, having suitable steam-ports, injection and ejection-pipes and passages, and supply and exhaust-connections, and the whole so constructed that the motion of the engine may be reversed at will, and the pressure of the steam brought at will to either the inside or outside of the valve. The valve's case and pipes are constructed of metal, and the slide-valve and case may be either cylindrical or square.

We will now proceed to describe its operation. With the valve H covering the ports E and D', (seen in fig. 1,) and the valve F adjusted as seen in fig. 7, the steam will be received from the boiler into the pipe K, then passing through the pipe I, in the direction indicated by the arrow, to the inside of the valve H, and through the ports D D and the passage O, to the cylinder of the steam-engine. The exhaust steam will be ejected from the cylinder, through the passage O', into the ports D' D', the bores of the valve and the ports E E, the latter connected as seen in fig. 2, and thence through the pipe I', and out through the exhaust-pipe K'.

Adjust the valve F, as indicated by the dotted lines seen in fig. 7, and I' becomes the induction-pipe, and I the eduction-pipe, and the induction and eduction of the steam will be reversed from that described, and the motion of the engine reversed—the steam will be received through the outer bores of the valve, and will be exhausted through the inside of the valve. In either case, it will be seen that the pressure of steam on the valve is uniform, whether it be from the inside or outside, and the valve is balanced.

The slide-valve may also be attached to a proper cylinder, and used as a double-acting pump, without any other valve, in which case the water will pass through the valve exactly in the reverse direction from the course of the steam, when the valve is used as a steam-valve.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The valve-bores S S, of the valve H, with lugs *r r*, constructed and arranged relatively to the cams *n n*, arms *m m*, provided with slots *x x*, and the valve-stem C, as a means of adjustment in compensating for wear of valves and valve-seats.

2. The valve-case A A, when constructed substantially as described, and arranged relatively to the slide-balance valve H, as herein set forth.

3. The arrangement of the hollow balance-slide valve H, throttle-valve F, with the valve-case A A, injection and ejection-pipes I I', supply-pipe K, and exhaust-pipe K', substantially as herein set forth.

JOHN S. EVERITT.  
OSSIAN COOK.

Witnesses:

W. G. RITCH,  
GEORGE GARY.