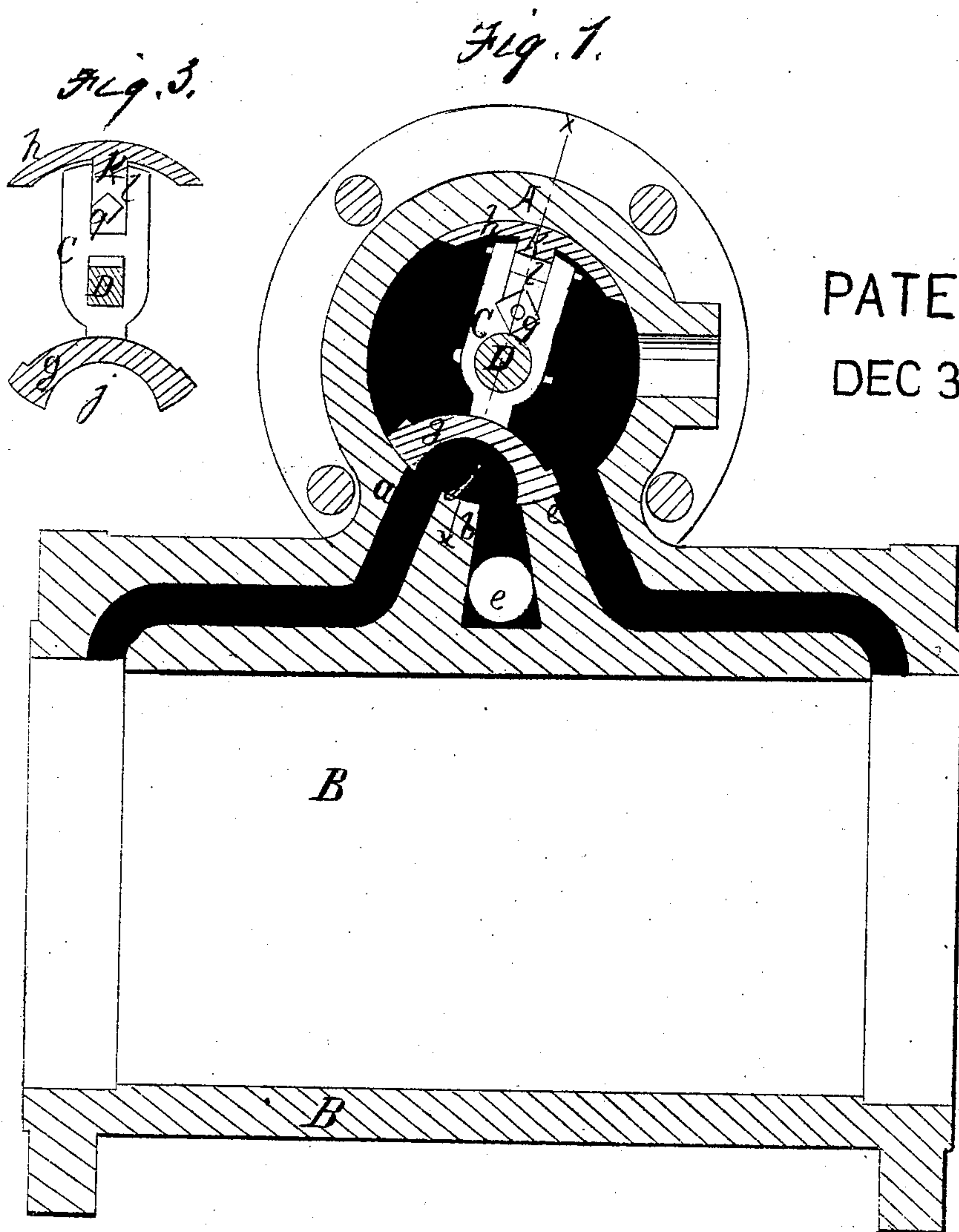


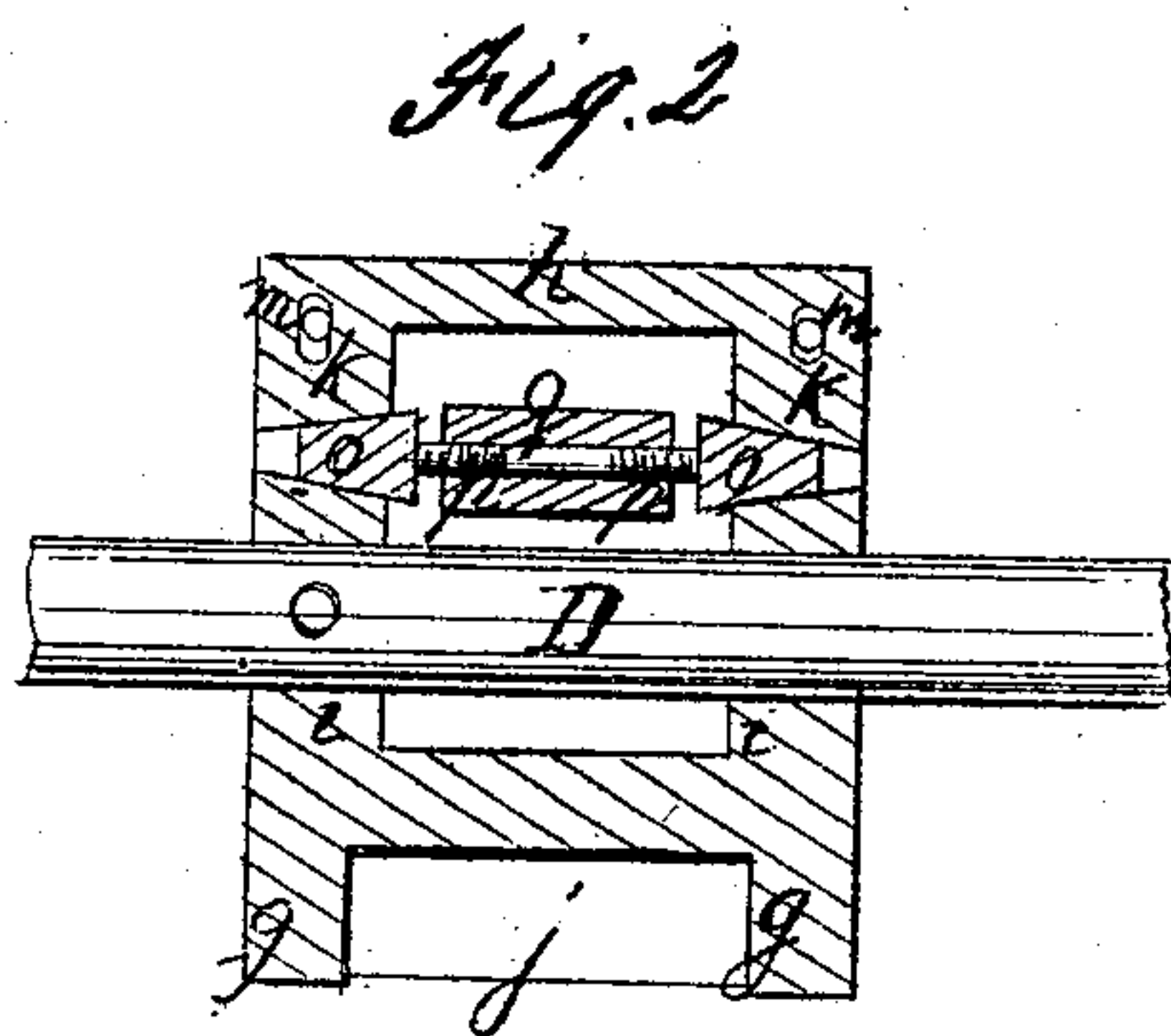
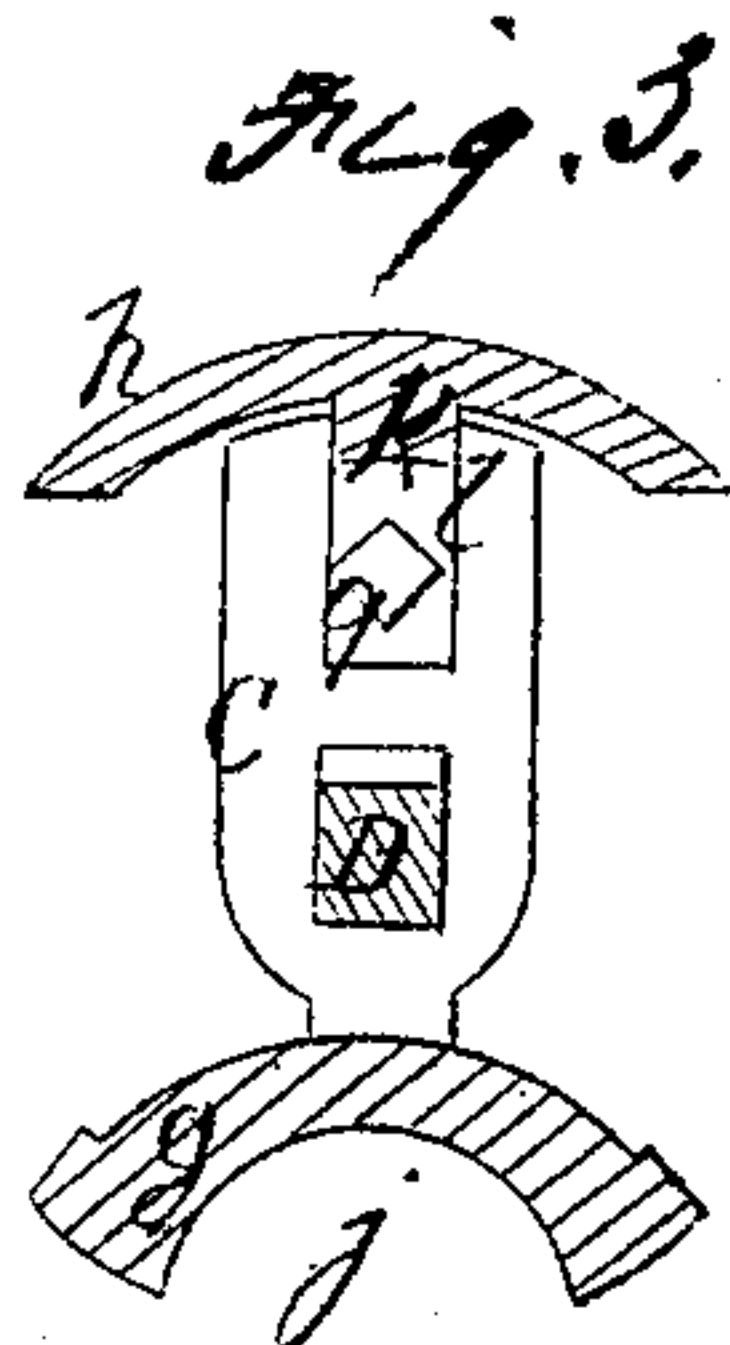
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J.F. MORSE,

BALANCED OSCILLATING VALVE



PATENTED
DEC 31 1867



Witnesses

P. I. Dodge,
Alex Mahon

Inventor

J. F. Morse
by Dodge & Munroe
his Attyys

United States Patent Office.

JOHN F. MORSE, OF OSHKOSH, WISCONSIN.*

Letters Patent No. 72,750, dated December 31, 1867.

IMPROVEMENT IN STEAM-ENGINE 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 I, JOHN F. MORSE, of Oshkosh, in the county of Winnebago, and State of Wisconsin, have invented certain new and useful Improvements in Balanced Oscillating Valves; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, and to the letters of reference marked thereon, like letters indicating like parts wherever they occur.

To enable others skilled in the art to construct and use my invention, I will proceed to describe it.

My invention relates to balanced oscillating valves for steam-engines, or when steam is used to work mechanism of any kind; and consists of certain new and useful improvements in their construction, and in a novel arrangement of mechanism for the convenient adjustment of the slide, when it becomes loose by wear or otherwise. In the drawings—

Figure 1 is a cross vertical section of the valve-chest and cylinder, and

Figure 2 is a longitudinal section of the slide, on the line *x x* of fig. 1.

Figure 3 is a cross vertical section of the valve-slide mounted on a square shaft.

I construct my valve-chest A of cylindrical form, and place it transversely over the cylinder B. In the lower side of the valve-chest A, I make three openings, *a b c*. The openings *a* and *c* lead to and are connected with the opposite ends of the cylinder B. The opening *c* is for the escape of the steam from the cylinder B, through the eduction-pipe C. The pipes or passages leading from the valve-chest A to the opposite ends of the cylinder B are cast in the shell of the cylinder, as shown in fig. 1. The steam I admit into the valve-chest A, through the pipe *f*. Within the valve-chest A, I place the balanced oscillating valve-slide C, mounted on the shaft D, to which it is keyed so as to turn with it. The form and construction of this slide are clearly shown in the drawings. It is made so as to leave the vacant space E, between its two faces *h* and *g*, within the valve-chest. The faces *h* and *g* are made circular, so as to slide upon the interior face of the valve-chest A. The face *g* is hollowed, so as to form a chamber, *j*, as shown in both figures, and just large enough to connect the pipes or steam-passages *a* and *b*, or *b* and *c*, as it oscillates. It also forms a solid part of the slide C, being cast with the cross-pieces *i*, through which the shaft D passes. The opposite balancing face-plate *h* is connected with the cross-pieces *i* by tongues *k*, which fit into corresponding grooves *l*, and are fastened by pins *m*. The bottoms of the grooves *l*, and the ends of the tongues *k*, I make wedge-shaped, as shown in fig. 2. The holes in the tongues *k*, through which the pins *m* pass, I make large enough to allow a vertical movement of the face-plate *h* for adjustment. Between the tongues *k* and the bottom of the grooves *l*, I insert the adjusting-wedges *o o'*, having stems *p p'*, having right and left screws cut upon them respectively. These stems *p p'* screw into a nut, *q*, as shown in fig. 2. By turning the nut *q* the adjustable wedges *o o'* will be forced in between the tongues *k* and the bottom of the grooves *l*, and the face-plate *h* be pressed closely against the interior face of the valve-chest A.

Instead of using a round shaft, D, as shown in figs. 1 and 2, and keying the valve-slide C to it, a square shaft may be used, as shown in fig. 3. When I use a square shaft, I make the slot in the valve-slide C, through which the shaft D passes, large enough to allow the valve-slide C to have a vertical movement on the shaft, as shown in fig. 3, and do not in that case key the valve-slide fast to the shaft, except to prevent a lateral movement. By this arrangement, in turning the nut *q* both of the face-plates *h* and *g* will be pressed closely against the interior face of the valve-chest A. The top and bottom, or upper and lower face-plates, I make of equal size, so that they may present the same extent of rubbing-surface to the face of the valve-chest, and in that way be balanced.

My valve is operated by means of the shaft D, and oscillates. It connects the steam-passages *a* and *b*, and then *b* and *c*, the steam in the first place entering the valve-chest A, and passing into the cylinder B, in the direction of the red arrows, as shown in fig. 1, and leaving the opposite side of the plunger in the cylinder, as shown by the red arrows in the same figure.

It will be readily seen that whenever the face-plates *h* and *g* become worn, so that the steam may pass between their surfaces and the opposing surfaces of the valve-chest, they can be conveniently and closely adjusted by turning the nut *q*, as already described.

Having thus described my invention, what I claim, is—

1. A balanced oscillating valve, having its face-plates *h* and *g* so arranged that as they are worn they may be adjusted by the wedges *o*, constructed and arranged to operate substantially as described.
2. The wedges *o* and the nut *q*, when constructed and arranged to operate substantially as described and for the purpose set forth.

J. F. MORSE.

Witnesses:

ANSEL JONES,

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**Assist to himself and Charles C. Page.*