

E. D. SPEER.
Balanced Slide-Valves.

No. 147,993.

Patented Feb. 24, 1874.

Fig. 1

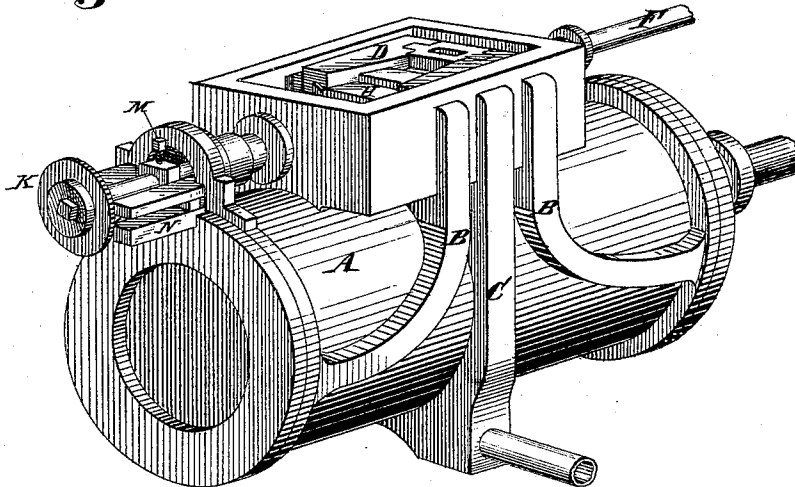
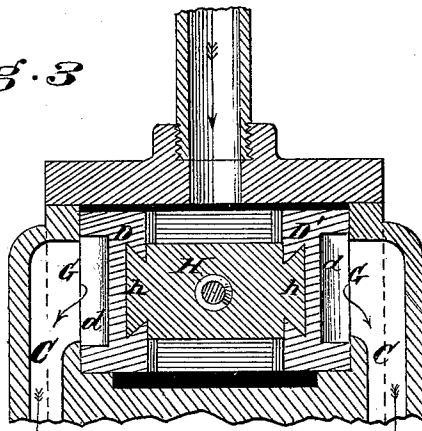


Fig. 3



Witness
Chas Crapsy

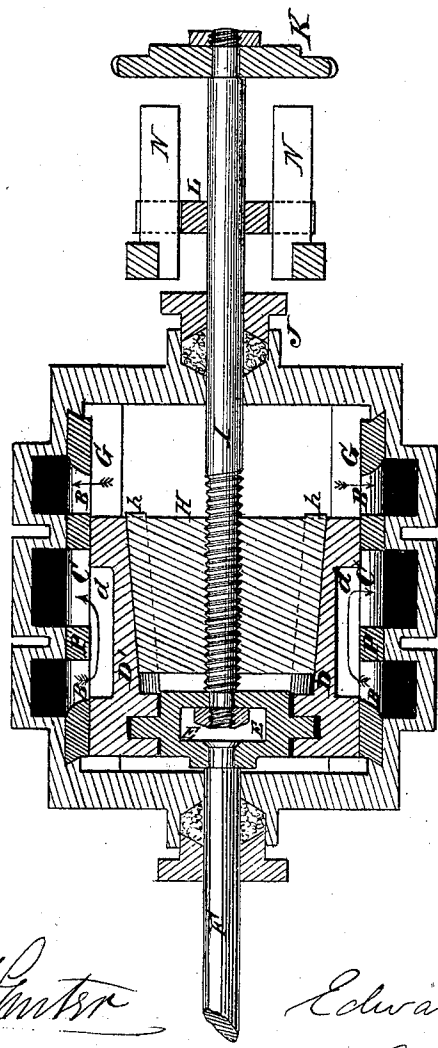
Inventor
Edward D. Speer
By F. Millward
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Fig. 2



Attest
Chas. Crapsey
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UNITED STATES PATENT OFFICE.

EDWARD D. SPEER, OF BROOKVILLE, INDIANA, ASSIGNOR TO GEORGE K. TAYLOR, OF CINCINNATI, OHIO.

IMPROVEMENT IN BALANCED SLIDE-VALVES.

Specification forming part of Letters Patent No. **147,993**, dated February 24, 1874; application filed January 3, 1874.

To all whom it may concern:

Be it known that I, EDWARD D. SPEER, of Brookville, Franklin county, Indiana, have invented a certain new Improvement in Balanced Slide-Valves of Steam-Engines, of which the following is a specification:

My invention relates to the class of balanced valves; and consists, in connection with ports for the cylinder and exhaust at each side of the steam-chest, of a two-part valve, so connected and operated with adjustable expansion devices that it may be adjusted between the sides of the chest, and form a close steam-joint to prevent leakage, and at the same time admit of adjustment while running.

Figure 1 is a perspective view of a cylinder, steam-chest, and valve embodying my invention. Fig. 2 is a horizontal section through the steam chest and valves. Fig. 3 is a cross-section through valves.

A is the steam-cylinder, having steam-ports B at each end, leading separately into the sides of the steam-chest, in manner shown, and at each side of the same. The exhaust-ports C are also on each side of the steam-chest, and made to join in one pipe to carry off the exhaust steam in the ordinary way. The valve is composed of two parts, D D', each of which acts as a valve independently, and both are employed to give a balanced character to the devices in operation. They are connected to a cross-head, E, tongued and grooved into the valves, or otherwise so loosely attached as to permit of the expansion or lateral adjustment of the valves. The cross-head E is attached to the valve-rod F, which gives motion to the valve in the ordinary way. To these parts D D' of the valve is connected a suitable expanding device, which forces them tightly against the seats G on each side, which seats contain the ports B C, and, owing to the loosely-connected cross-head and presence of such expanding device, the valves are kept against the seats, so as to preserve a tight joint, the expanding device being so made as to tie the valves together in such a way as to prevent either from being forced against its seat by the steam-pressure. The valves, there-

fore, when operating, will be perfectly balanced.

In order to provide for the adjustment of these valves while the engine is running, I construct the expanding device as follows: The inner faces of the valves are inclined to each other, and between them a wedge, H, is fitted, which has dovetailed tongues *h* upon it, fitting into dovetailed grooves to match in the backs of the valves, the wedge serving to expand the valves when forced between them, and the dovetails to contract them when the wedge is withdrawn. This wedge, it is obvious, may be adjusted by devices which will not permit adjustment while running; but I prefer that it should be capable of adjustment while the engine is in operation; and to this end I attach to the cross-head, by a swivel-joint, as shown, a screw-threaded rod, I, the smooth part of which extends through a stuffing-box, J, in the steam-chest, and the screw part of it moves into a tapped hole in the wedge. The outer end of the rod I is fitted with a hand-wheel, K, the rotation of which serves to change the relation of the wedge and valves to each other, so that the valves are more or less expanded or contracted by its operation; and this adjustment is permitted during the operation of the engine, and thus provides for varying expansion of metal in the valves under different temperatures of the steam. To provide against the accidental rotation of this rod I, it is fitted with a cross-head, L, having a set-screw, M, the cross head moving in the ways or slides N. By the release of the set-screw, the rod is permitted to rotate for adjustment, and by the tightening up of the same an accidental adjustment is prevented.

The valves D D' have the customary exhaust-cavities *d* to form communication between each steam-port B and exhaust-port C alternately. The lower part of the chest, below the valves, is cut away, as shown, so as to let the valves rest only on narrow surfaces, and pressure downward is thus guarded against.

The seats G may be faced with steel, as shown by letter P in Fig. 2.

I claim—

1. The valves D D', connected together by an independently-adjustable wedge, H, and operated by a cross-head, E, and rod F, substantially as specified.

2. The combination of valve-seats G with ports B C, adjustable dovetail-grooved valves D D', adjustable tongued wedge H, and screw-

threaded rod I, operating in the manner and for the purpose described.

In testimony of which invention I hereunto set my hand.

EDWARD D. SPEER.

Witnesses:

JOHN HUNTER,

J. L. WARTMANN.