

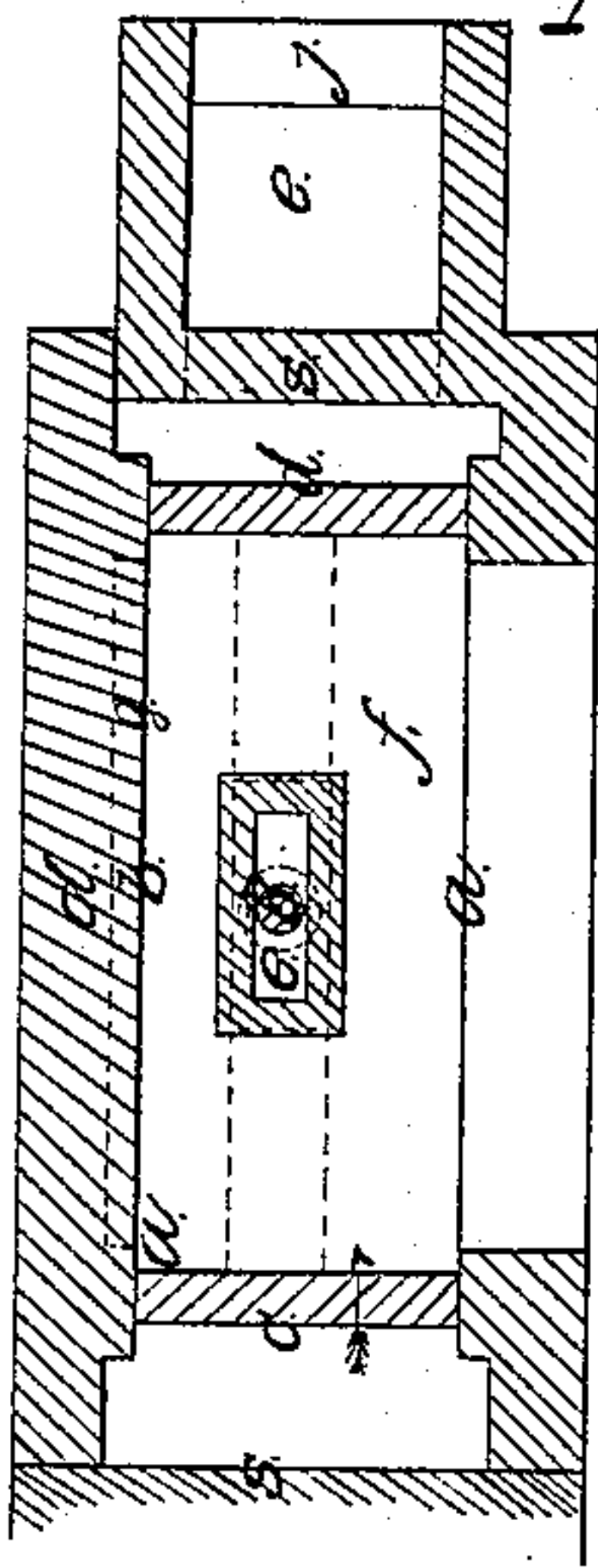
*E. D. Learitt, Jr.,*

*Steam Balanced Valve.*

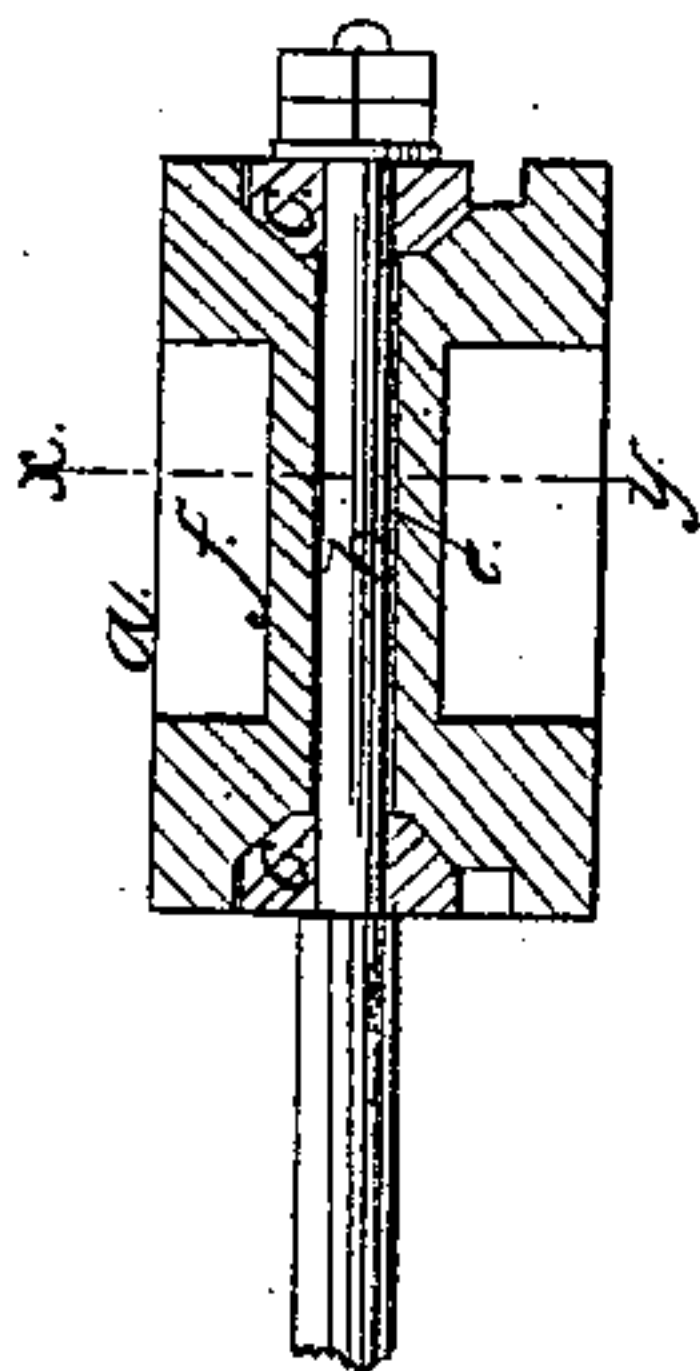
*N<sup>o</sup> 13,923.*

*Patented Dec. 11, 1855.*

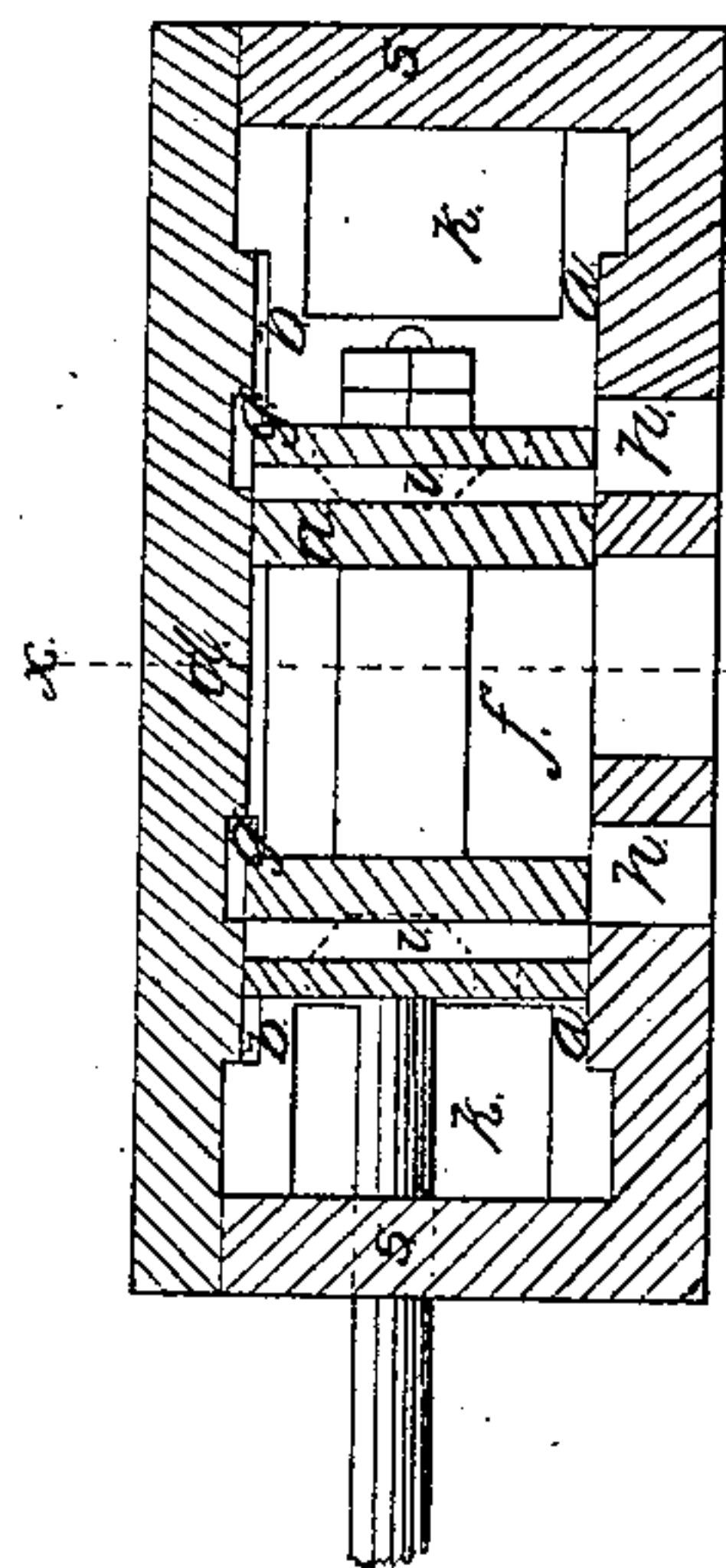
*Fig. 3.*



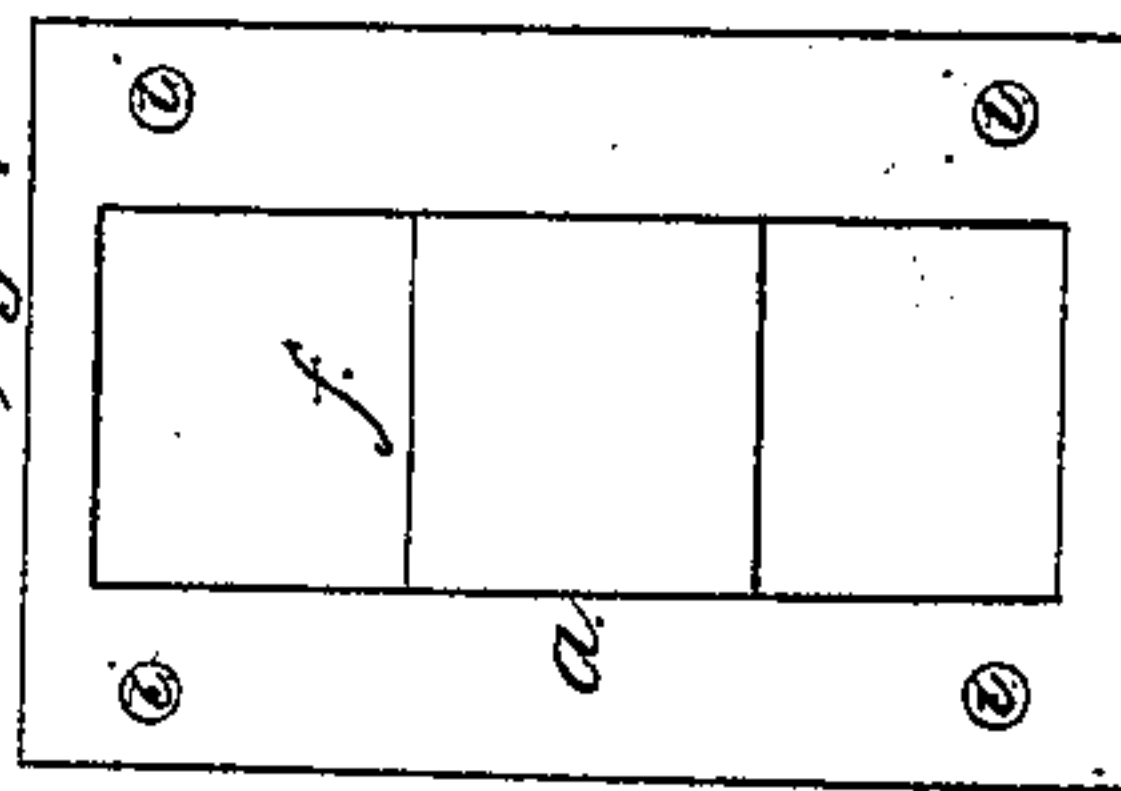
*Fig. 2.*



*Fig. 1.*



*Fig. 4.*



# UNITED STATES PATENT OFFICE.

E. D. LEAVITT, JR., OF LOWELL, MASSACHUSETTS.

## IMPROVEMENT IN SLIDE-VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 13,923, dated December 11, 1855.

*To all whom it may concern:*

Be it known that I, E. D. LEAVITT, Jr., of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Balance Slide-Valves for Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a section of the valve and steam-chest parallel with the direction of the motion of the valve. Fig. 2 is a central section of the valve in a plane parallel to the plane of Fig. 1. Fig. 3 is a transverse section of the valve and chest in the plane indicated by the line *x y* in Figs. 1 and 2. Fig. 4 is a face view of the valve.

Similar letters of reference indicate corresponding parts in the several figures.

In carrying out this invention the back of the valve is fitted to the cover of the steam-chest, between which and its seat it works steam-tight.

My improvement consists in a certain method of compensating for the wear of the valve and the two faces between which it works.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A is the valve, which is made tapering in a transverse direction, as shown in Fig. 3, but has its two faces parallel in a longitudinal direction, as shown in Fig. 1. The valve-seat *a* and the interior face, *b*, of the cover D of the steam-chest S are tapered laterally to correspond with the tapered faces of the valve. By thus tapering the valve one side, *c*, is caused to have a greater area than the other side, *d*, and the steam, exerting a greater pressure on the larger area *c*, tends to force the valve in the direction shown by the arrow in Fig. 3, and thus keeps the valve tight between the faces *a* and *b*, notwithstanding any wear. In order to admit of the necessary lateral movement of the valve to compensate for the wear, the valve-rod B is fitted to a slot, *e*, which is made through the valve, and plates C C, which are

fitted snugly to the rod, serve as guides to this lateral movement, and at the same time preserve the proper relation between the valve and rod, so as to cause the former to be moved by the latter. The back of the valve is made of the same form as the face, and the exhaust-cavity *f* is made completely through to the back of the valve. In the face *b* of the steam-chest cover there are formed two cavities, *g g*, which are of the same size as and exactly opposite to the steam-ports *h h* in the valve-seat, and holes *i i* are drilled or otherwise made through the valve from the face to the back to form communications between the steam-ports and the said cavities *g g* when the ports *h h* are closed to the steam in the steam-chest. By carrying the exhaust-cavity *f* right through the valve and providing therein the holes or passages *i i*, and providing the cavities *g g* in the cover D of the steam-chest, the back of the valve is caused to be exposed to the action of the steam, both during eduction and induction, in precisely the same manner as the face, and the valve is thereby perfectly balanced.

In order to give the steam free passage to both steam-ports, I provide a channel, E, at one side of the steam-chest, of the whole length thereof, to receive the steam at *j*, (see Fig. 3,) which is supposed to be at the middle of its length, and I provide this channel with two openings, *k k*, (see Fig. 1,) leading into the steam-chest—one at each end.

What I claim as my invention, and desire to secure by Letters Patent, is—

Making the valve and the corresponding parts of the steam-chest between which it works of tapering form laterally, and fitting the valve to its rod in such a manner as to be capable of lateral movement, substantially as herein described, whereby the valve is always kept tight between its seat and the back of the steam-chest by the pressure of the steam and the wearing of the rubbing-surfaces is always compensated for.

E. D. LEAVITT, JR.

Witnesses:

O. T. LANPHEAR,  
B. F. RIX.