

J. F. Hamilton,
Steam Balanced Valve.

No 39,344.

Patented July 28, 1863.

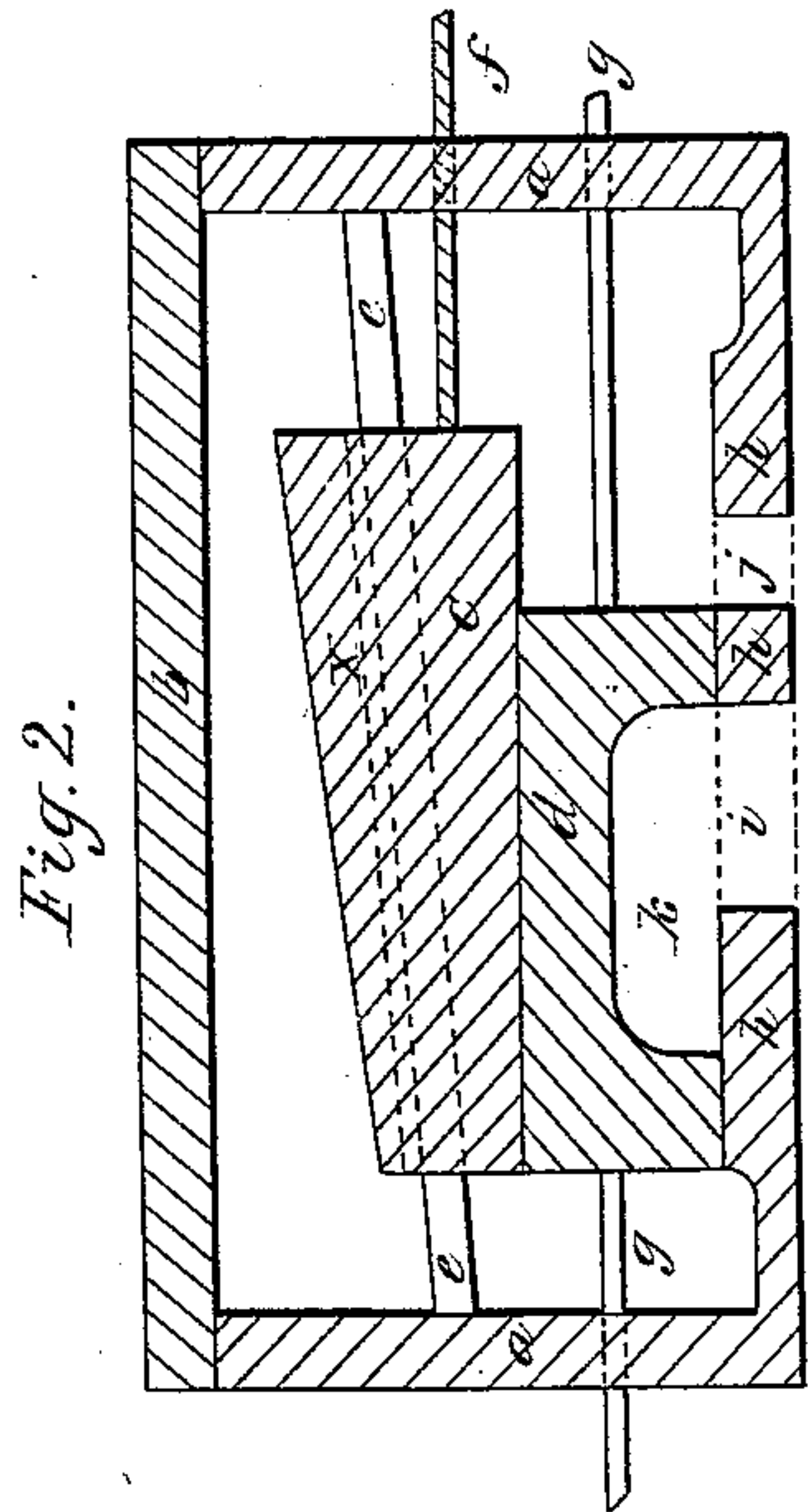


Fig. 2.

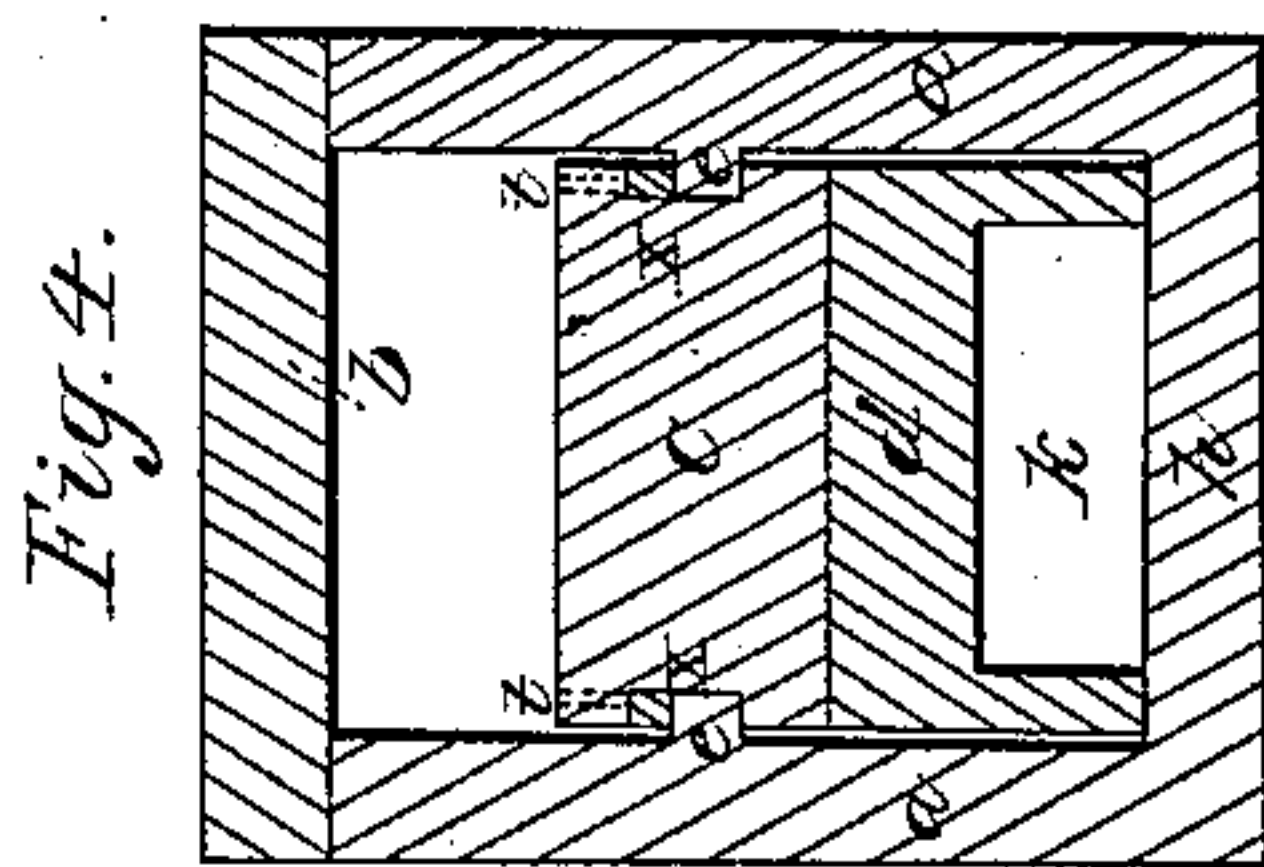


Fig. 4.

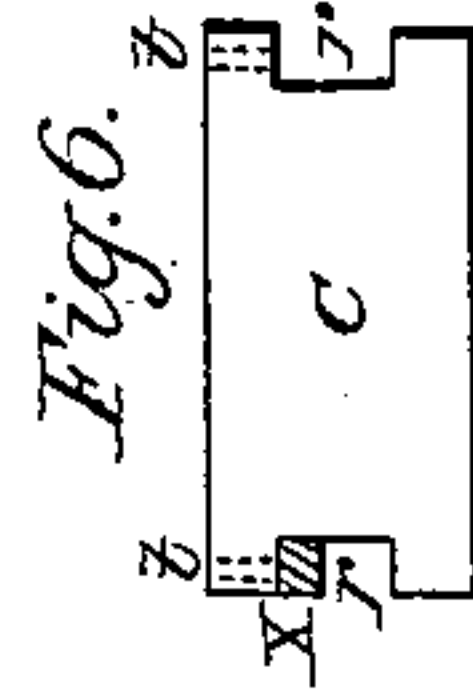


Fig. 6.

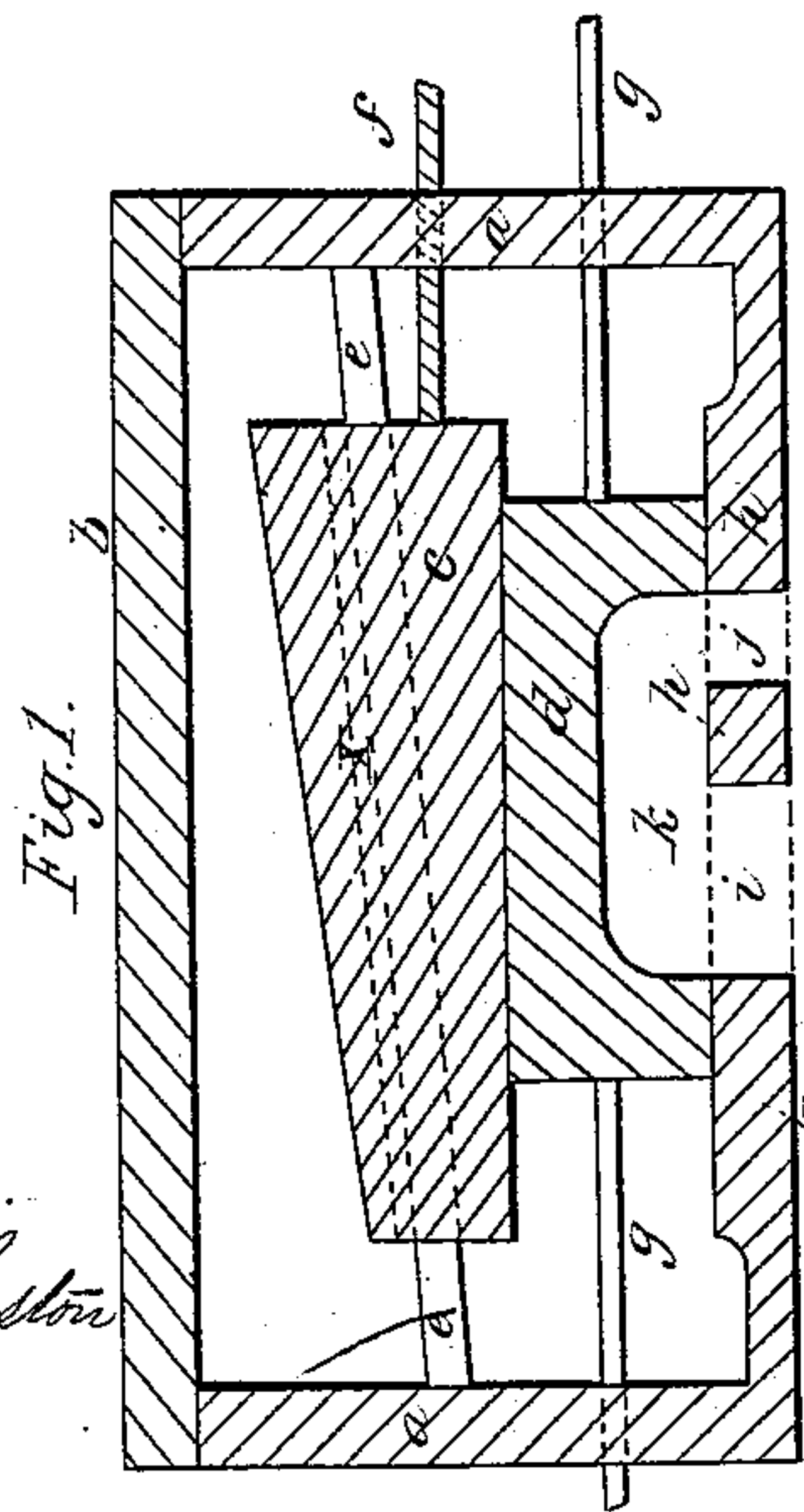


Fig. 1.

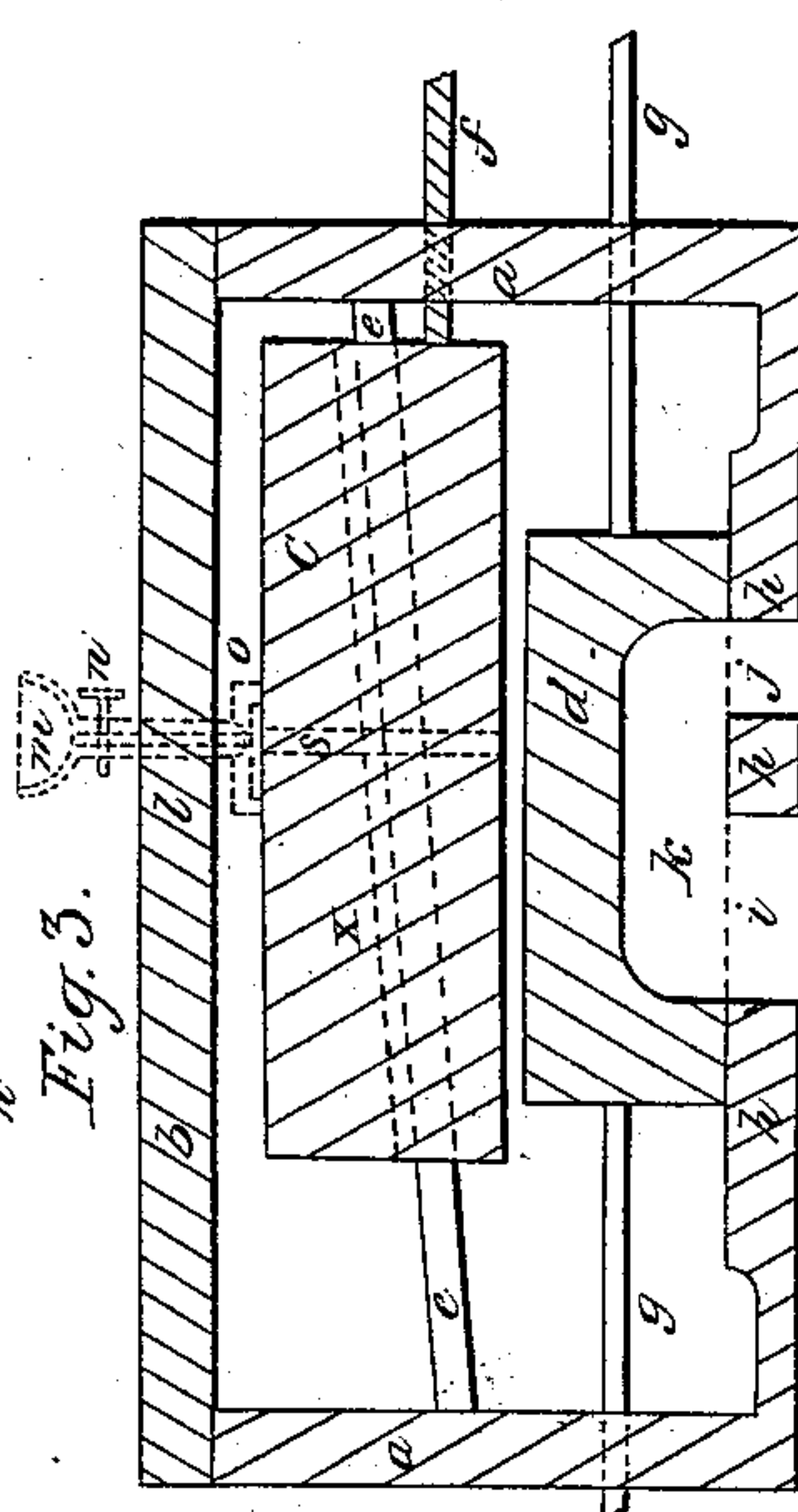


Fig. 3.

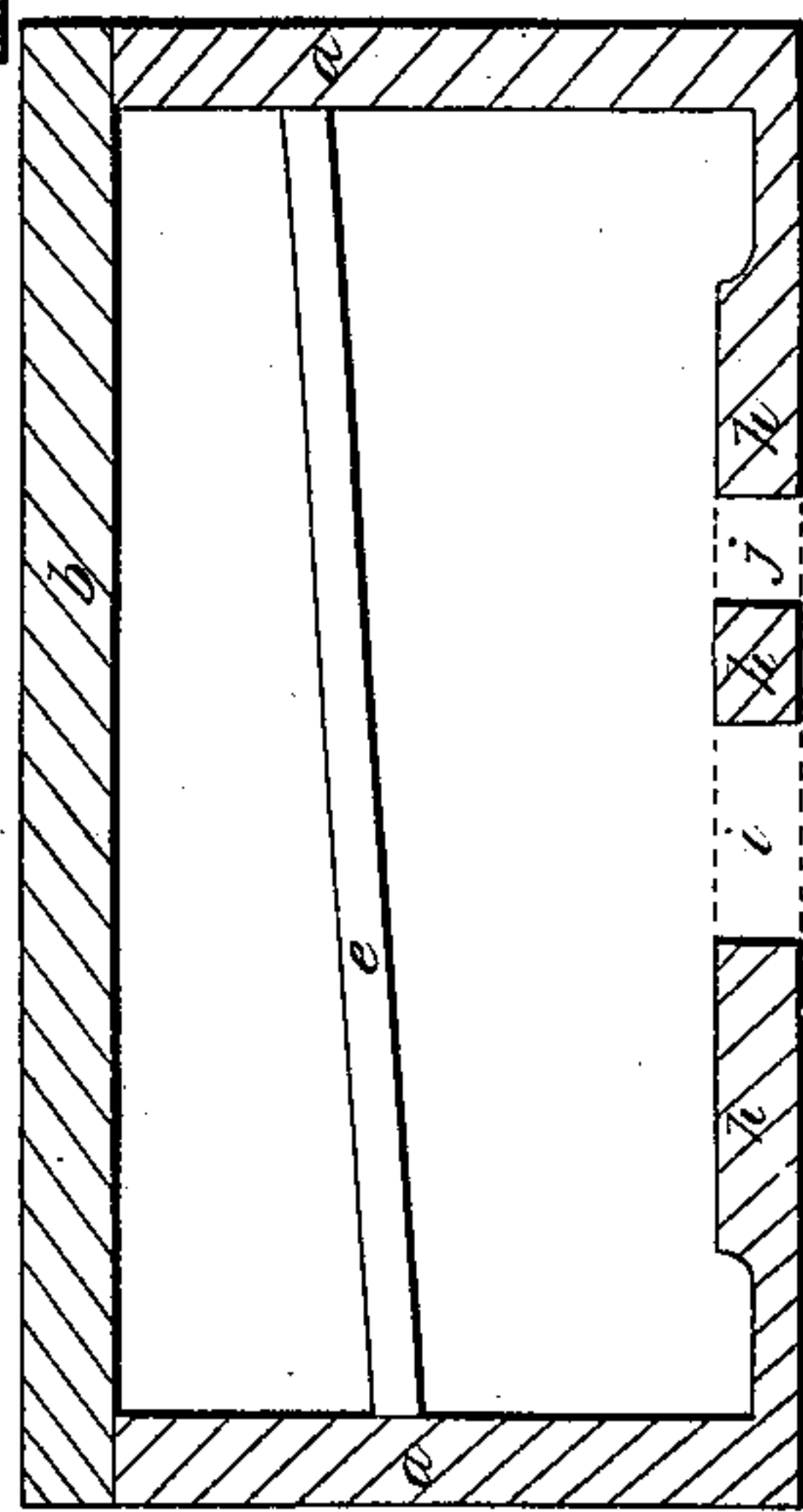


Fig. 5.

Witnesses.
James J. Johnston
Alexander Hays

Inventor.
Joseph F. Hamilton

UNITED STATES PATENT OFFICE.

JOSEPH F. HAMILTON, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN SLIDE-VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 39,344, dated July 28, 1863.

To all whom it may concern:

Be it known that I, JOSEPH F. HAMILTON, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement for Relieving Slide-Valves from the Pressure of Steam; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in the use of inclined planes placed on the sides of a steam-chest, and grooves in a plate placed over a slide-valve, said inclined planes and grooves being used in connection with a metallic compound and a screw for the purpose of fitting, setting, and adjusting said plate to the slide-valve, the whole being constructed, arranged, and operating in the manner substantially as hereinafter described.

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

In the accompanying drawings, Figures 1 and 2 represent longitudinal and sectional views of the ordinary steam-chest and slide-valve, furnished with the suspended plate for relieving the valve from the pressure of the steam. Fig. 3 is a sectional view of the steam-chest and slide-valve, and represents the suspended plate drawn up the inclined planes and off the valve. Fig. 4 is a transverse and sectional view of the steam-chest, slide-valve, and suspended plate. Fig. 5 is a sectional view of the steam-chest. Fig. 6 is a transverse and sectional view of the suspended plate.

In the accompanying drawings, *a* represents the steam-chest. *b* represents the lid of the steam-chest. *c* represents the suspended plate, the under side of which is planed and dressed true. *d* represents the slide-valve, the upper and lower faces of which are planed and dressed parallel with each other. *e* represents the inclined planes, which are cast on the inner sides of the steam-chest. The upper sides of these planes are planed, dressed, and made parallel with each other. *f* represents a screw used for the purpose of moving the suspended plate up and down on the inclined planes *e*. *g* represents the valve-stem. *h* represents the valve-seat. *i* represents the exhaust-opening. *j* represents the steam-port. *k* represents the cav-

ity in the slide-valve. *r* represents grooves in the sides of the suspended plate. These grooves are made wider than the inclined planes *e*, for the purpose of allowing room for a strip of "Babbitt metal," or other soft metallic compound. *t* represent openings made in the suspended plate, for purpose of running the metallic compound into the grooves and on the inclined planes. *x* represent strips of Babbitt metal or other metallic compound.

The red dotted lines *l m n o s* represent the following device or arrangement: *l* represents a hollow screw, on the upper end of which is placed an oil cup, *m*. *n* represents an oil or steam cock. *o* represents a small block or strip of iron, the under side of which is hollowed out for the purpose of allowing the suspended plate to be moved up or down on the inclined planes, and still have the opening *s* in the plate *c* kept in free communication with the hollow screw *l*, which is fitted to a cavity made in the top of the block or strip *o*. By this arrangement the valve *d* and plate *c* may be oiled, and leakage of steam between the valve and plate may be detected, and it also answers as a means for holding down the valve and plate to their place. Having the various parts made and dressed as herein described, I arrange the valve *d* on its seat *h*. I then place the plate *c* on top of the valve, with the inclined planes in the grooves *r*. I then run the metallic compound into the grooves and onto the inclined planes through the openings *t*. Thus, by the use of the grooves and the metallic compound, the suspended plate is with ease and certainty fitted to the inclined planes and to the top of the valve. Another very great advantage gained by the use of the metallic compound is overcoming the difference in the expansion between the plate *c* and valve *d*. The valve being of greater depth or thicker than the plate *c*, it will of necessity expand more, and will thereby press against the plate and lift it from its seat on the inclined planes. Now, this difficulty can be entirely obviated by the use of some one of the known metallic compounds. It is a fact well known to mechanics skilled in metallurgy that many of the soft metallic compounds now in use will expand more than the metal of which slide-valves are usually made. Now, by ascertaining the difference in the expansion between the two metals and by mak-

ing the strips *x* in such proportion that their expansion will be equal to the expansion of the valve, the difficulty arising from the difference in expansion between the valve and plate will be overcome.

The operation of my improvement is as follows: Having all things arranged as set forth, with the lid *b* of the steam chest secured to its place, the steam is then conducted into the chest *a* in the usual manner; but the pressure of the steam, which usually comes on the top of the valve, causing it to press heavily on its seat, is received by the suspended plate, thereby relieving the valve from pressure and making it truly a balance slide-valve. The suspended plate *c* is raised up off or brought down on the valve by means of the screw *f* and the inclined planes *e*. It will be observed that by turning the screw *f* in one direction it

will lower the plate *c* on the inclined planes, and by turning it in an opposite direction it will raise it on the planes. Hence the plate *c* is adjusted to the valve simply by turning the screw *f*.

I wish it to be clearly understood that I do not claim, broadly, the use of a plate placed over a slide-valve for relieving it from the pressure of the steam. I am aware that such device has been used for that purpose; but

What I do claim as of my invention is—

The use of the grooves *r* and inclined planes *e*, when used in combination with the plate *c*, screw *f*, and a metallic compound, as herein described, and for the purpose set forth.

JOSEPH F. HAMILTON.

Witnesses:

JAMES J. JOHNSTON,
ALEXANDER HAYS.