W. STEPHENS.

BALANCED-VALVE.

No. 189,512 Patented April 10, 1877.

Fig 1

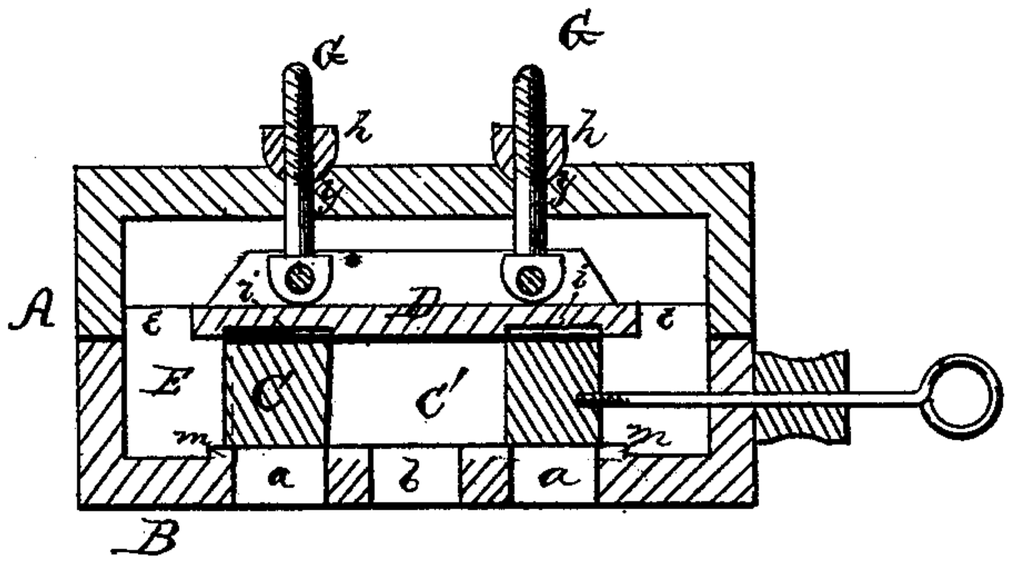

Fig 2

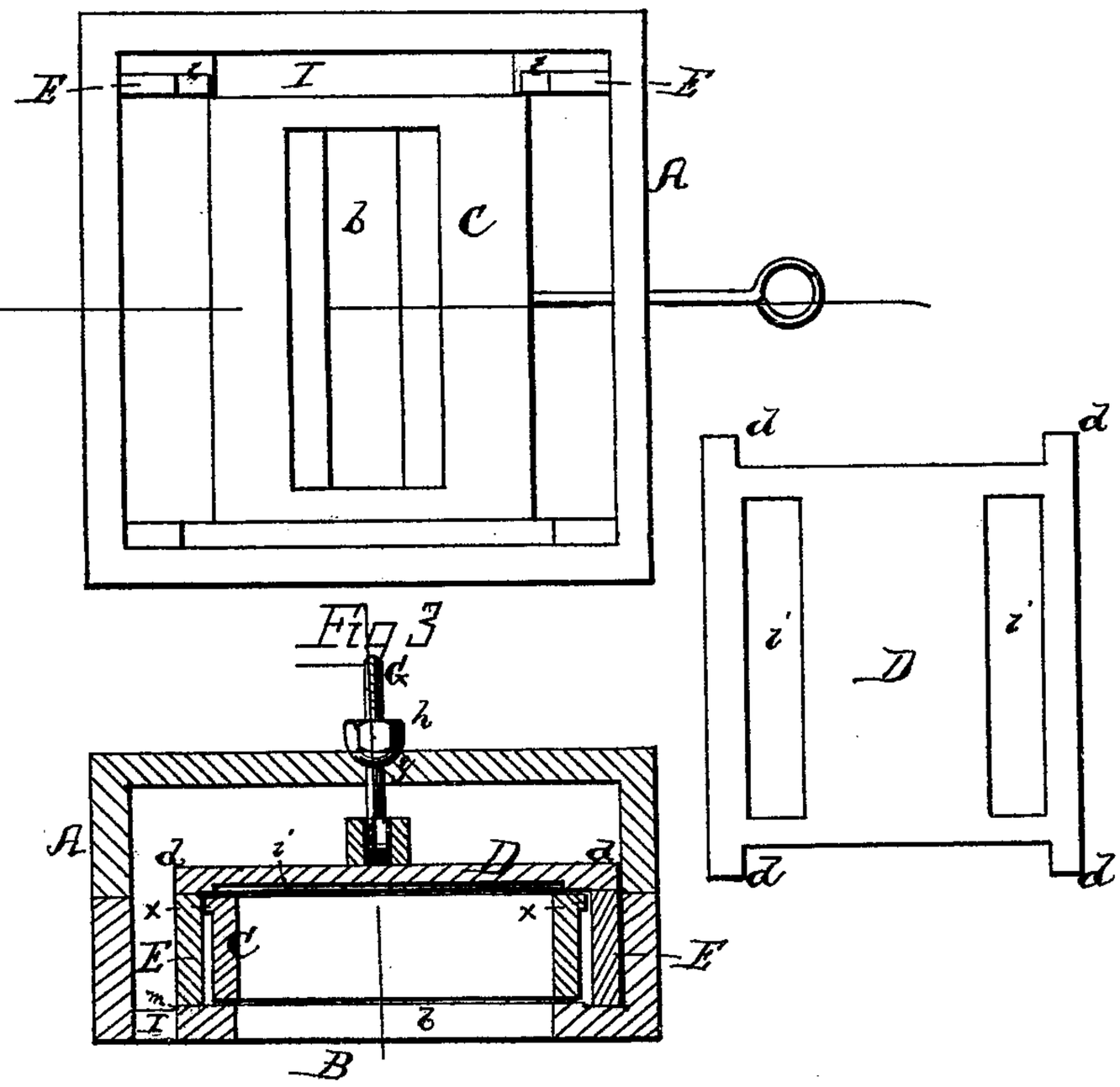

Fig 3

Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM STEPHENS, OF PITTSTON, PENNSYLVANIA.

IMPROVEMENT IN BALANCED VALVES.

Specification forming part of Letters Patent No. **189,512**, dated April 10, 1877; application filed February 13, 1877.

To all whom it may concern:

Be it known that I, WILLIAM STEPHENS, of Pittston, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Slide-Valves for Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

The nature of my invention consists in the construction and arrangement of a slide-valve for steam-engines, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a longitudinal vertical section of the steam-chest with slide-valve. Fig. 2 is a plan view of the valve. Fig. 3 is a cross-section of the chest and valve.

A represents the steam-chest attached to the cylinder-face B, in which are the usual steam-ports *a a* and exhaust-port *b*. C is the slide-valve, above which is a loose back, D, provided with lugs or projections *d d*, resting upon shouldered supports E E, for the purpose of taking the load off the valve, allowing the valve to work free between the faces B and D, and still remain steam-tight. The valve C is formed with a central opening, C′, and the loose back D forms the top of the valve. The supports E are cast on the face of the cylinder inside of the steam-chest, and the shoulders *e e* on top of the supports prevent the plate D from moving horizontally with the valve.

The back or top of the valve C is larger than the face, it having projections *x* along its sides at the top, as shown in Fig. 3, for the purpose of allowing the steam to act on said enlarged surface, to assist in supporting the weight of the valve.

On the top of the loose back or plate D are suitable lugs or ears, between which are pivoted two bolts, G G, that extend up through the cover of the steam-chest, and have nuts *h h* screwed upon their upper ends, for the purpose of regulating the plate upon the valve when the steam is on. The nuts *h h* are made beveled or convex, and ground to fit the cavities or seats *y y* in the steam-chest cover, for the purpose of making it steam-tight, and regulating the pressure of the plate upon the valve when the steam is on.

It will be noticed that while the nuts *h h* prevent the plate D from going down beyond the point to which it has been adjusted, they form no impediment for the plate and valve being raised when required.

In the under face of the plate D are recesses *i i*, of the same size as the steam-ports *a a*, for the purpose of equalizing the pressure on the valve when steam enters the cylinder.

The valve C rests on a raised seat, *m*, and the plate D is the same length as said raised seat, in the same direction as the travel of the valve, so that the steam may act on both sides of the valve when the valve travels beyond the raised face.

I is the inlet for the steam to the steam-chest.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The combination, in a slide-valve for steam-engines, of the raised seat *m* and shouldered supports E within the valve chest, the valve C, having enlarged back projections *x*, the plate D, provided with recesses *i* and lugs *d*, and the bolts G, with nuts *h*, all constructed and arranged to operate substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

WILLIAM STEPHENS.

Witnesses:

JAMES HELM,

JOHN MERRITT.