(No Model.)

H. D. DUNBAR.

BALANCED SLIDE VALVE.

No. 414,027. Patented Oct. 29, 1889.

FIG. 1

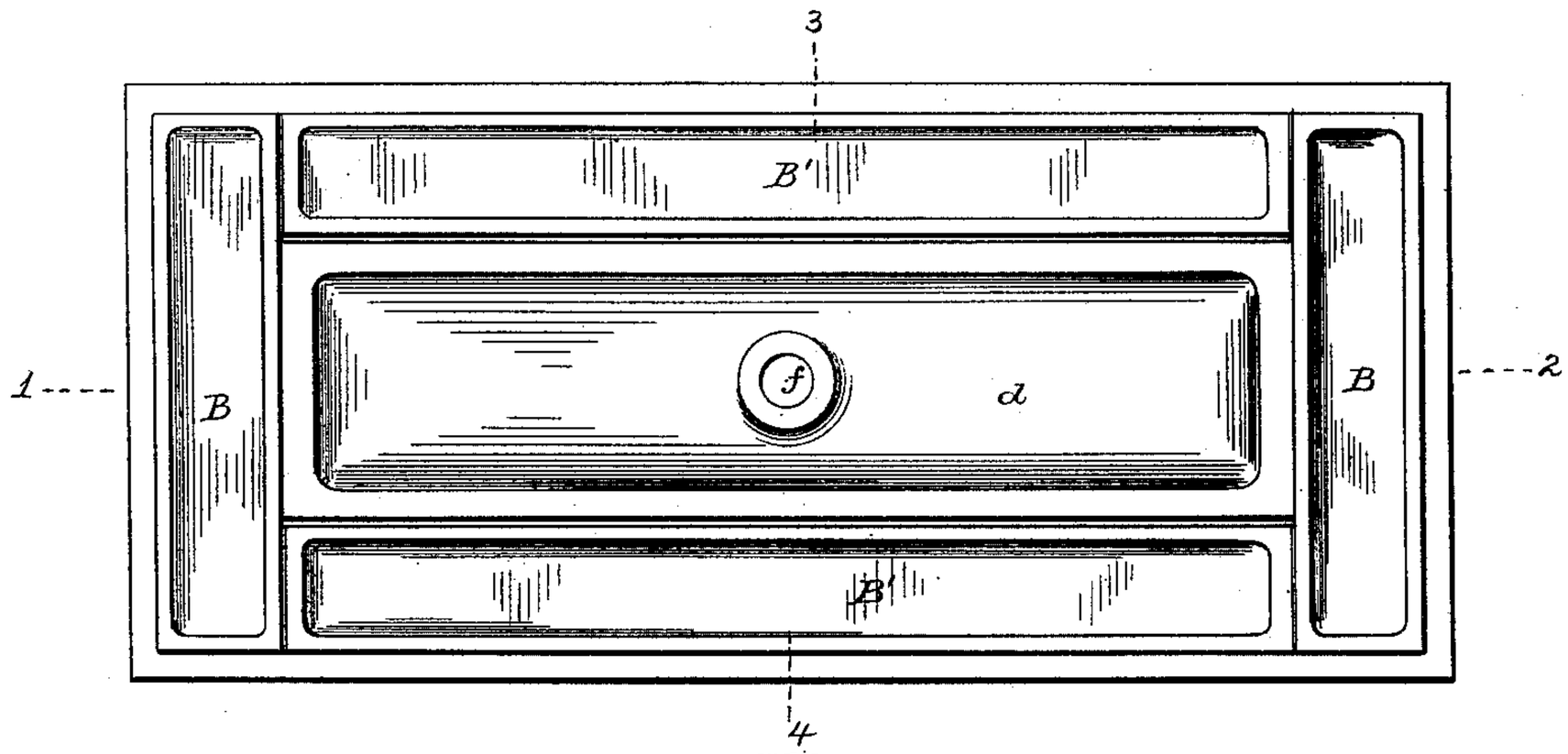


FIG. 2.

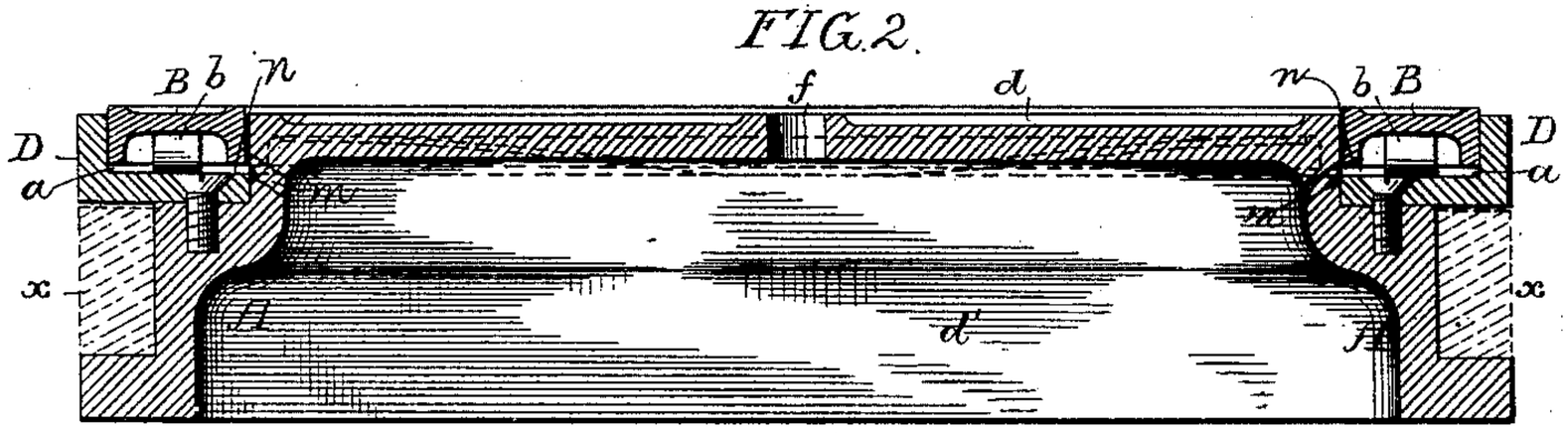
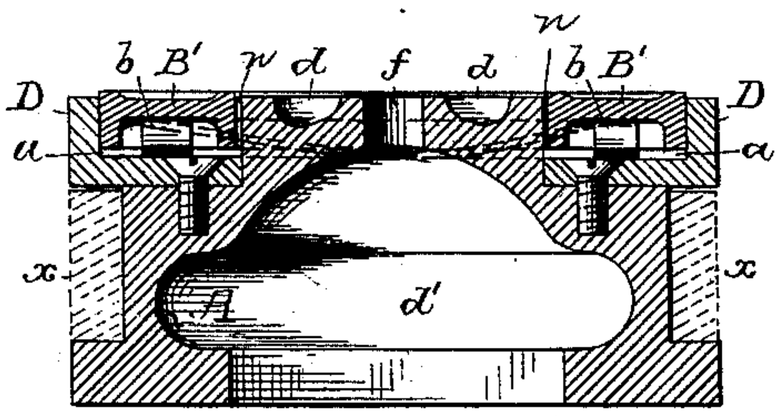


FIG. 3.



Witnesses.
John J. Geary
Harry Smith

Inventor
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by his attorneys
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UNITED STATES PATENT OFFICE.

HENRY D. DUNBAR, OF NORTH HARTLAND, VERMONT.

BALANCED SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 414,027, dated October 29, 1889.

Application filed July 22, 1889. Serial No. 318,223. (No model.)

To all whom it may concern:

Be it known that I, HENRY D. DUNBAR, a citizen of the United States, and a resident of North Hartland, Windsor county, Vermont, have invented certain Improvements in Balanced Slide-Valves, of which the following is a specification.

My invention relates to that class of slide-valves for steam-engines in which the back of the valve is provided with packing-strips extending around the valve and bearing upon the valve-chest cover or upon a suitable bearing-plate in the valve-chest, the object of my invention being to so construct a valve of this character that it may, without being blown from its seat, be used in an engine in which reversal is effected by admitting the live steam to the exhaust-chamber instead of to the valve-chest. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of a valve for steam-engines constructed in accordance with my invention. Fig. 2 is a sectional view of the same on the line 1 2, Fig. 1; and Fig. 3 is a sectional view on the line 3 4, Fig. 1.

A represents the valve, in the back of which is a chamber *a*, extending around the valve close to the outer edge of the same, and to this chamber are adapted the side and end packing-strips B B′, which are free to move vertically in the chamber, and are pressed up against the valve-chest cover or against a suitable bearing-plate in the valve-chest by means of springs *b*, so that when the valve is being used in the ordinary way live steam from the steam-chest is prevented from gaining access to the back of the valve, and excessive pressure upon the latter is prevented.

At the back of the valve is a chamber *d*, which is in communication with the exhaust-chamber *d′* through an opening *f* in the back of the valve. In these valves as ordinarily constructed, however, the area of this chamber *d* is less than the area of the exhaust-chamber *d′* of the valve; hence the valve would be lifted from its seat if used in that class of engines in which reversing is effected by admitting live steam to the exhaust-chamber. I overcome this objection by providing a communication between the chamber *a* of the valve and the chamber *d* at the back of the same, or between the chamber *a* and the exhaust-chamber of the valve, and by making the chamber *a* of such area that the aggregate area of the chambers *a* and *d* will be considerably greater than the area of the exhaust-chamber *d′*, so that the valve will be held down firmly to its seat when the full steam-pressure is exerted in the exhaust-chamber. The chamber *a* may be placed in communication with the exhaust-chamber by means of passages *m*, such as shown by dotted lines in Fig. 2, if the packing-strips B B′ fit snugly in the chamber; but I prefer to permit the packing-strips, or at least the end packing-strips B′ B′, to have slight lateral play in the chamber, so that steam can gain access to said chamber through the spaces *n* between the inner sides of the strips and the inner walls of the chamber, as shown in Figs. 2 and 3, the pressure serving to keep the strips pressed firmly against the outer wall of the chamber, so as to prevent the escape of steam therefrom, or, on the other hand, the strips being pressed firmly against the inner walls of the chamber when the live-steam pressure is exerted in the valve-chest.

In order to provide for carrying the chamber *a* close to the outer edge of the valve without necessitating the use of an enlarged yoke *x* or the cutting of a groove in the outer sides of the valve for the reception of said yoke, I use a right-angled frame D, which projects over the yoke and forms the bottom and outer wall of the chamber *a*, and is bolted to a seat properly formed upon the valve above the top of the yoke, as shown in Figs. 2 and 3.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The valve having in the back an inner chamber communicating with the exhaust-passage and an outer chamber containing packing-strips, said inner and outer chambers presenting an area in excess of that of the exhaust-chamber of the valve and both being in communication with the exhaust-chamber, substantially as specified.

2. The combination of the valve having inner and outer chambers formed in the back of the same, with packing-strips adapted to

said outer chamber and free to move laterally therein to a slight extent, so as to permit steam to pass from the central chamber to the outer chamber behind the packing-strips, substantially as specified.

3. The combination of the body of the valve and the packing-strips at the back of the same with an angular frame secured to the body of the valve and forming with the same a chamber for the reception of said packing-strips, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY D. DUNBAR.

Witnesses:

WILLIAM D. CONNER,

HARRY SMITH.