(No Model.)

E. B. SINTZENICH

BALANCED VALVE.

No. 334,136. Patented Jan. 12, 1886.

Fig. 1.

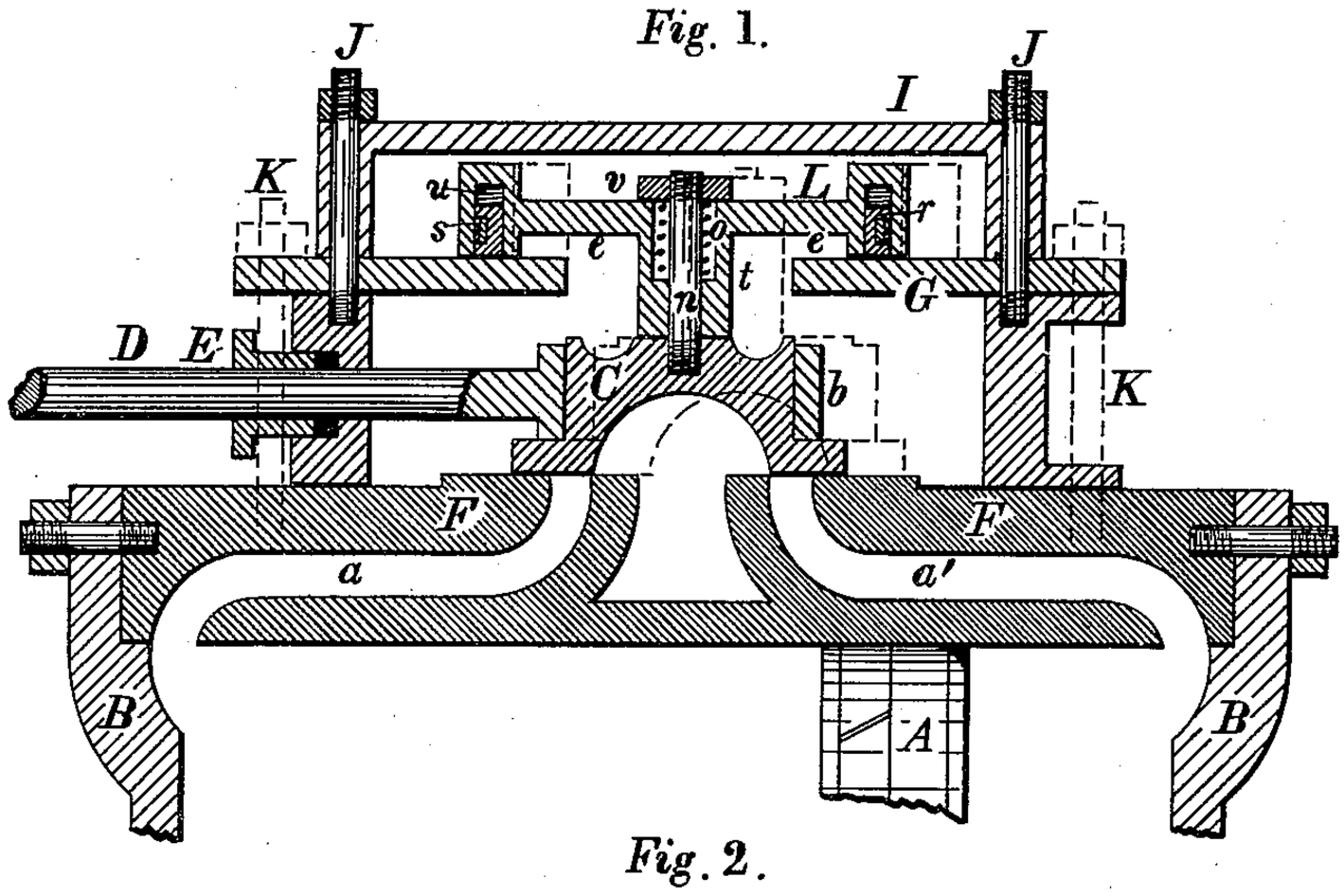


Fig. 2.

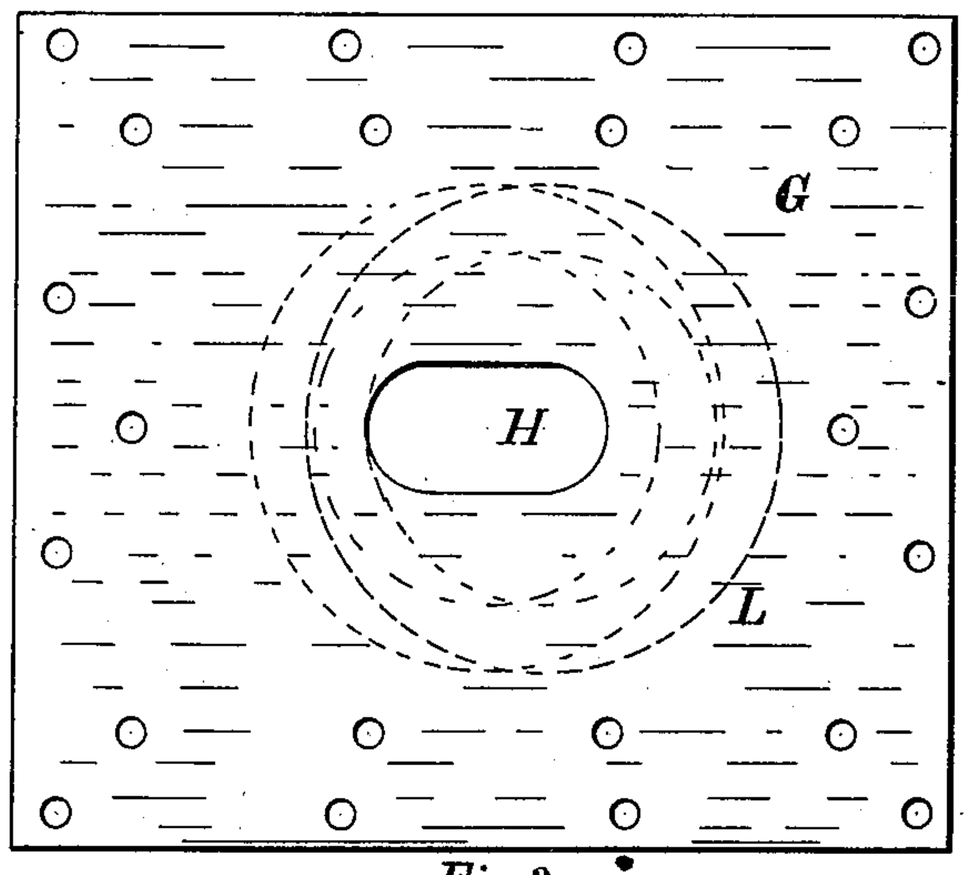
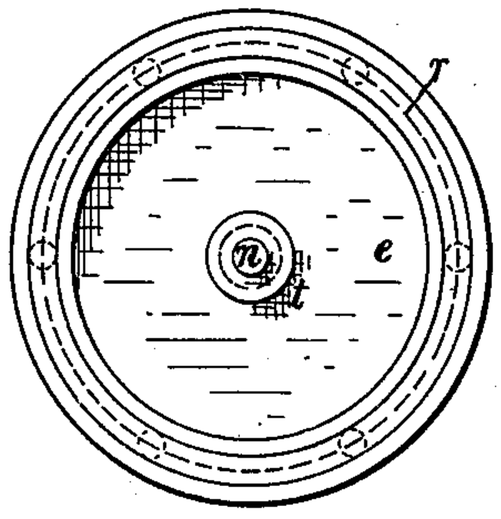


Fig. 3.



WITNESSES=

H. G. Phillips.

Arthur P. Selden.

INVENTOR=

E. B. Sintzenich,

by Geo. B. Selden,

Atty

UNITED STATES PATENT OFFICE.

EDWIN B. SINTZENICH, OF ROCHESTER, NEW YORK.

BALANCED VALVE.

SPECIFICATION forming part of Letters Patent No. 334,136, dated January 12, 1886.

Application filed May 21, 1883. Serial No. 95,647. (No model.)

To all whom it may concern:

Be it known that I, EDWIN B. SINTZENICH, of Rochester, New York, have invented an Improved Balanced Valve for Steam-Engines, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to certain improvements on balanced valves for steam-engines, which improvements are hereinafter more fully described and specified.

My improved balanced valve for steam-engines is represented in the accompanying drawings, in which—

Figure 1 is a longitudinal section of a steam-cylinder having my improved balanced valve applied thereto. Fig. 2 is a plan view of the slotted plate. Fig. 3 represents the face of the balance-valve.

In the accompanying drawings, representing my improved balance-valve, A is the piston of a steam-cylinder; B B, the cylinder-heads; C, the slide-valve; D, the valve-rod; E, the valve-rod gland; F, the cylinder-wall having steam-passages *a a'*; G, the slotted plate; I, the outer cover, and L the recessed balance-plate.

My improved balance-valve is capable of being applied to the slide-valve of a steam-engine of any ordinary construction. The piston-rod D is attached to the slide-valve in any preferred way, the mode of attachment shown in the accompanying drawings being by an eye or loop, *b*, secured on the end of the piston-rod and surrounding the body of the valve. The slotted plate G, which occupies the position of the steam-chest cover in engines of the usual construction, is fastened to the cylinder by the bolts K or other suitable means of attachment, its outer or upper surface being finished to a true plane and arranged parallel to the seat of the slide-valve C. In the back of the slide-valve is inserted the stud *n*, which passes through the recessed balance-plate L, and causes it to reciprocate to and fro with the slide-valve.

The balance-valve is provided on the side which bears against the slotted plate G with a recess, *e*, the area of which should be somewhat less than the area of the slide C exposed to the pressure of the steam in the steam-chest.

The difference between the areas of the slide-valve and the balancing plate may be varied according to the pressure which is deemed necessary to hold the slide-valve on its seat, and by properly proportioning this difference in area the whole or any desired part of the pressure of the steam which forces the slide-valve against the seat may be balanced.

I prefer to make the balance-plate circular, although it may be made of any other preferred form. A groove is turned in the face of the balance-plate, into which the packing-ring *r* is fitted, which is pressed against the slotted plate G by any suitable springs, *u*, Fig. 1.

In order to prevent leakage of steam about the ring *r*, it is itself fitted into the groove in the balance-plate by one or more packing-rings, *s*, Fig. 1.

The ring *r* may be solid or divided, so as to be sprung into the groove, and the ring or rings *s* are sprung into a groove in the ring *r* in the same manner as piston-rings are ordinarily fitted to steam-pistons.

The springs behind the ring *r* in the recessed balance-plate will compensate for any slight difference in expansion in the parts; but in the case of small engines, or wherever it is desired to avoid the expense of the packing-ring *r*, a recess may be formed in the boss *t* of the packing-ring, through which the stud *n* passes, and a spring, *o*, introduced into it, by which the balancing valve is pressed against the plate G. In this case the stud *n* is provided with a nut, *v*, on its outer end, against which the spring *o* bears.

The balance-plate is inclosed in an outer casing, I, secured to the plate G or to the cylinder by the bolts J J.

A suitable drip-cock may be provided on the casing.

It will be observed that the parts are so proportioned that in the reciprocating motion of the balance-plate the edge of the recess only comes up to the end of the slot H in the plate G, so that steam is never allowed to escape from the steam-chest into the casing I.

My improved balance-valve may be applied

to many forms of engine now in use, it being particularly adapted for use on railway locomotive-engines.

I claim—

The combination, with a steam-cylinder and piston, of the slide-valve C, slotted plate G, and balance-plate L, attached to the slide-valve by a connection passing through the slot in the plate, and provided with the spring *o*, to compensate for expansion, substantially as and for the purposes set forth.

E. B. SINTZENICH.

Witnesses:
GEO. B. SELDEN,
H. G. PHILLIPS.