

(No Model.)

J. P. LIGHTBODY.
BALANCED SLIDE VALVE.

No. 489,129.

Patented Jan. 3, 1893.

Fig. 1.

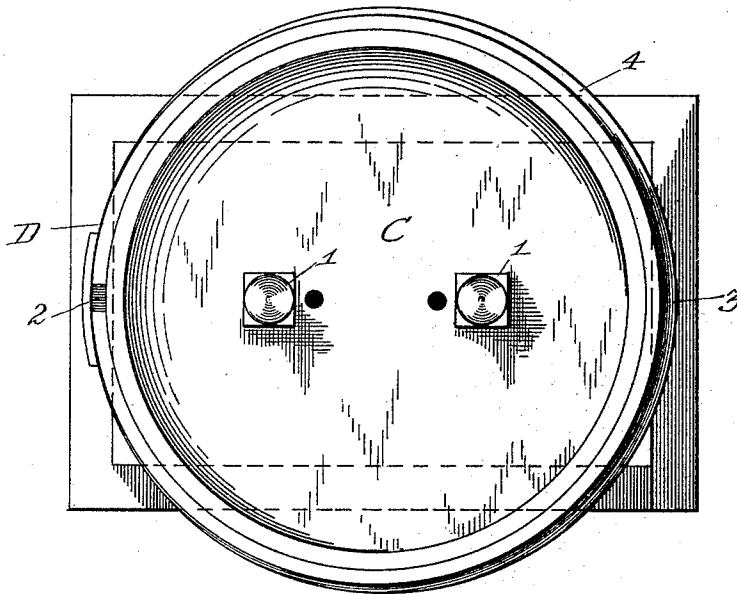
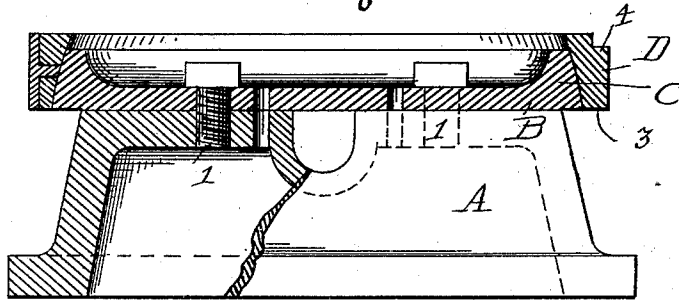


Fig. 2.

Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN P. LIGHTBODY, OF SAN FRANCISCO, CALIFORNIA.

BALANCED SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 489,129, dated January 3, 1893.

Application filed August 25, 1892. Serial No. 444,058. (No model.)

To all whom it may concern:

Be it known that I, JOHN P. LIGHTBODY, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Balanced Slide-Valves; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to that class of balanced slide valves in which an expansible metallic ring is interposed between the top of the steam chest and a circular rib on the top plate of the valve so as to make a close steam tight joint to exclude the steam from the top of the plate. In an application for Letters Patent, filed November 16, 1891, Serial No. 412,077, I described a valve of this character, in which the rib on the top plate of the valve, and the surrounding expansible ring formed a section of a ball and socket joint. The improvements hereinafter described relate to the construction of the ring itself, such ring being adapted for use in a valve like that shown in said application, or to any other valve of substantially the same character. In other words while I consider the ball and socket connection between the ring and the rib, as the best for the purpose, I do not in this case limit myself to such a joint, my improvements being adapted to expansible rings used for this purpose, no matter what their cross section may be. In using these expansible rings for making a steam tight joint in slide valves it is evident that when the ring expands the strain instead of being diffused throughout the length of the ring is concentrated at a single point, which is the point opposite the split or cut which permits the ring to expand. Where the ring is of equal thickness throughout its whole extent the effect of this strain or pressure is to weaken the metal of the ring at the point thus exposed to it, causing the ring in time to lose a part of its elasticity, and thus render it unfit for use. I have found that by increasing the thickness of the ring at the point opposite the opening and causing it to taper in both directions to the opening, the strain or pressure is diffused throughout the

extent of the ring, so that no particular point is affected by it.

For a full comprehension of my invention reference must be made to the following detailed description and to the drawings accompanying it, in which—

Figure 1, is a part elevation and part longitudinal section of the valve and ring; Fig. 2, is a plan view.

A is an ordinary slide valve, and B is a circular plate secured to the top of the valve in any suitable way as by bolts or screws 1, or formed in one piece with the valve if preferred. The plate B is provided with an annular rib C, raised upon its upper face and of such height as to leave a clear space of from an eighth to a quarter of an inch between the rib and the cover of the steam chest, the amount of such space being properly proportioned to the size of the valve. I prefer to make the exterior face of the rib in the form of a segment of a sphere, as in my application previously referred to, but such shape is not material to the purposes of the present invention.

D represents an elastic or expansible ring cut through as shown at 2, and having its inner face so formed as to fit the exterior face of the rib B, and form a steam tight joint. It will be understood that when in working position, the upper face of the ring bears against the cover of the steam chest, while the steam pressure against the outside surface of the ring forces the ring against the rib, thus making both joints constantly tight. The ring of course adjusts itself automatically to compensate for any variation in parallelism between the cover of the chest and the valve. By reference to the drawings it will be seen that the ring is thickest at a point opposite the cut or opening in it. From this point it tapers in both directions as best shown in Fig. 2, the result being that the amount of metal in the ring is gradually increased toward the point where the strain caused by expansion is most severe. The increased thickness of the ring as indicated at the point 3, in Fig. 1, would naturally permit the steam to exert a greater pressure at that point than at any other; such pressure gradually diminishing as the ring

tapers toward the opposite side. To compensate for this inequality in pressure, I form in the upper face of the ring a tapering groove or recess 4, of sufficient capacity to admit sufficient steam to compensate for the variation in pressure just alluded to. I have shown this groove as tapering, because the ring itself tapers; but it is evident that when a ring of equal thickness throughout is used, and the steam pressure on the bottom of such ring is sufficient to cause too much friction by contact with the cover of the chest, such friction may be reduced by forming a groove in the top of the ring of any size and shape to receive steam enough to produce a pressure on top to compensate for the excess of friction. I have shown in the drawings a clip for closing the

opening in the ring, like that described in my application previously referred to.

What I claim is—

An expansible ring for a slide valve cut through at a certain point and increasing in thickness gradually in both directions from said point, and having upon its upper surface a tapering groove or recess, substantially as and for the purposes set forth.

In testimony whereof I have affixed my signature, in presence of two witnesses, this 17th day of August, 1892.

JOHN P. LIGHTBODY.

Witnesses:

L. W. SEELY,
M. K. BRYAN.