

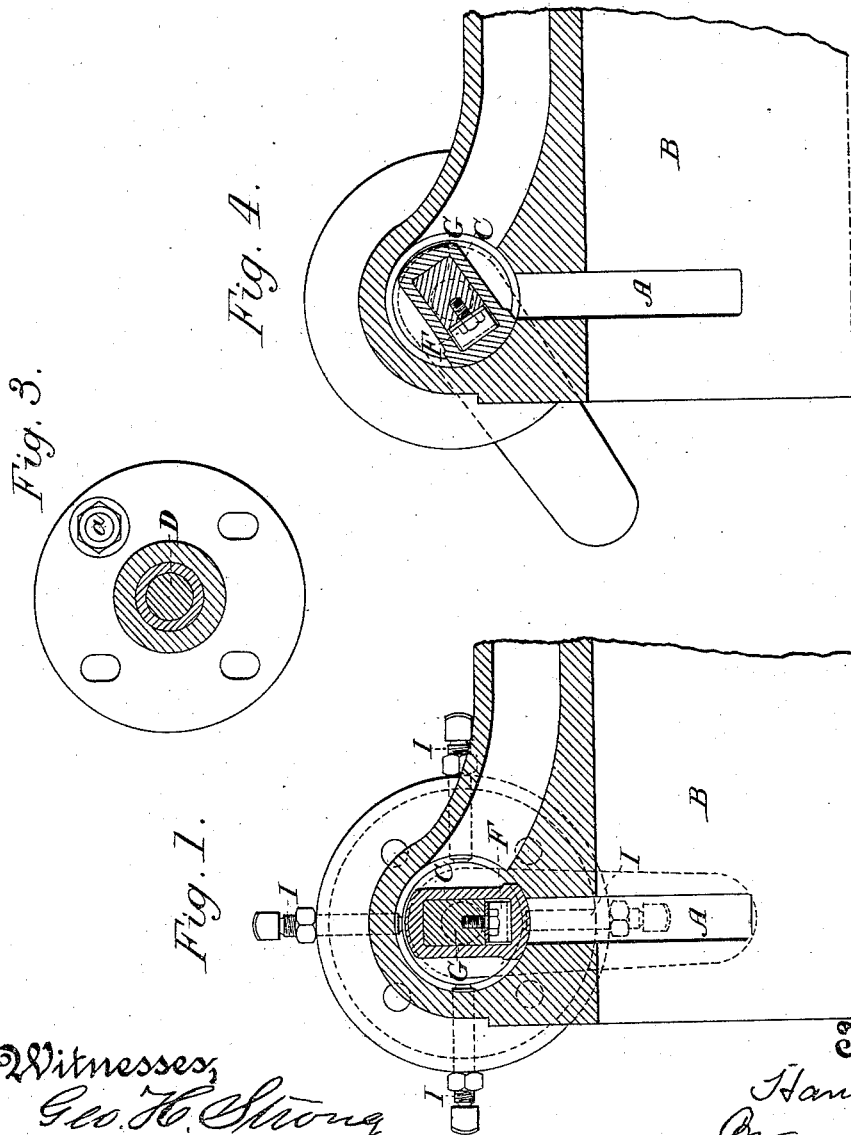
(No Model.)

2 Sheets—Sheet 1.

H. C. BEHR.  
BALANCED ROTARY VALVE.

No. 305,131.

Patented Sept. 16, 1884.



Witnesses,  
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J. H. Strong

Inventor,  
Hans C. Behr  
By  
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attorneys

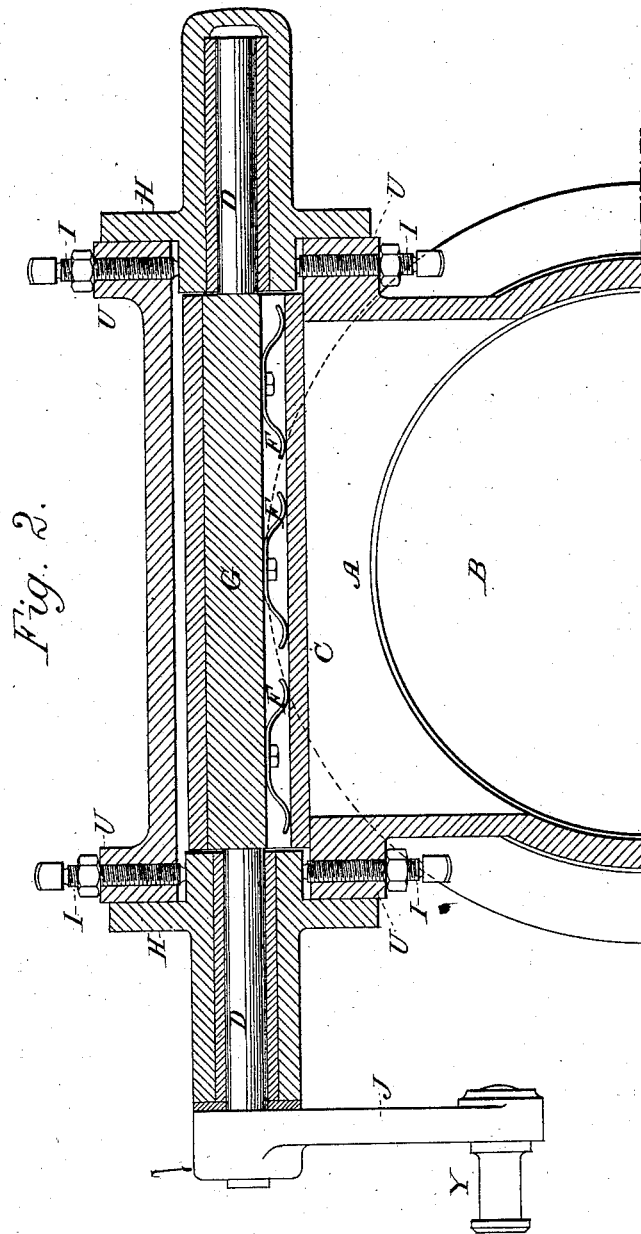
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J. H. House.

Inventor  
Hans C. Behr  
By  
Dewey & Co.  
attorneys

# UNITED STATES PATENT OFFICE.

HANS C. BEHR, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF  
W. I. SALKELD, OF SAME PLACE.

## BALANCED ROTARY VALVE.

SPECIFICATION forming part of Letters Patent No. 305,131, dated September 16, 1884.

Application filed January 17, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, HANS C. BEHR, of the city and county of San Francisco, and State of California, have invented an Improvement in Balanced Rotary Valves; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to certain improvements in that class of valves which fit a concave cylindrical seat and vibrate or oscillate about their longitudinal axes to open or close the steam-ports in the valve-face, and which are best known as "Corliss valves."

It consists of a valve supported upon a trunnion-bar which is adjustably journaled in the heads of the valve-chamber, springs by which the valve is kept in contact with the valve-seat, but is allowed to rise under a back-pressure greater than that within the chamber, and a means for adjusting the trunnion-bar, all of which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a section taken transversely across the valve-chamber, valve, and trunnion-bar. Fig. 2 is a longitudinal vertical section of the valve-chamber and valve transverse to the axis of the cylinder and through the steam-port. Fig. 3 is a section transverse to the trunnions exterior to the valve-chest cover, showing the head of the latter. Fig. 4 is a section taken transversely across the valve-chamber, showing the steam-port A open.

A is the steam-port leading from the valve-chamber to the cylinder B, and it is shown covered by the valve C in its closed position. This valve is rotated upon axial trunnions D, like the ordinary Corliss valve, to open and close it, the trunnions turning in bearings in the valve-chest covers H, and having a rocker-arm, J, attached to one end and a pin, Y, upon the arm, by which connection is made to valve-gear, in the usual manner.

The valve C is made hollow, with a rectangular opening extending axially through it, and is mounted upon the rectangular trunnion-bar G. The opening in the valve through which the trunnion-bar extends is larger than the bar in the direction vertical to the valve-face, and the bar is provided with springs F

below, which press upon the lower part of the valve, and thus hold it down so that its upper part rests upon the top of the bar. These springs permit the valve to rise from its seat under any excess of pressure within the cylinder over that above the valve. This raising of the steam-valve under compression, or when there is water in the cylinder, often prevents fracture of cylinder-heads or other damage to the engine. The valve-chest covers H project into the valve-chest a short distance, this part being of less diameter than the inside of the chamber where they lie. This projecting part is held and adjusted by set-screws I, which pass through the flange U of the valve-chest, as shown in Fig. 2. The covers are secured to the valve-chest flanges by screw-bolts *a a*. The holes in the covers through which these bolts pass are made larger than the diameter of the bolts, and with their greatest enlargement in the direction parallel to a line drawn through the center of the valve and the port A, because the greatest adjustment is required in this direction.

It will be evident that the valve may be raised or lowered with the covers by means of the set-screws I, and adjusted so that the steam-pressure upon the back of the valve will be thrown upon the trunnions D, and not upon the valve-seat; or, in other words, the valve-face and valve-seat will not be in actual contact, but will still be close enough together to prevent leakage of steam into the cylinder. This reduces the friction as many times as the diameter of the trunnions is less than that of the valve.

Since the valve C is not rigidly fixed upon the trunnion-bar G, but merely hangs upon it, and is held down by the springs F, so that it cannot rise upon the bar, it will be manifest that if the valve should ever come out of the adjustment it could never bind upon its seat, (as in the case of adjustable conical valves rigidly connected with the bar,) and the resistance to motion would in such a case be only as much as in the ordinary Corliss valve.

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

1. A valve fitting a concave cylindrical

valve-seat so as to open and close the steam-  
port by oscillation about its axis, and having  
a longitudinal rectangular opening, in combi-  
nation with a rectangular trunnion-bar pass-  
5 ing through it, and upon the top of which the  
upper side of the valve-opening rests, trun-  
nions or journals upon which the bar turns,  
adjusted by radial screws, and an arm or de-  
vice connected with one of the trunnions, by  
10 which it may be oscillated, substantially as  
herein described.

2. A valve fitting a concave cylindrical  
valve-seat so as to open or close the steam-  
port by oscillation about its axis, and having  
15 a longitudinal rectangular opening through it,  
in combination with a rectangular trunnion-  
bar extending through it, trunnions or jour-  
nals upon the ends passing into the valve-  
chamber heads, and radial screws by which  
20 the heads or trunnion journal-boxes may be  
moved and the valve adjusted with reference  
to the seat, substantially as herein described.

3. A valve fitting a concave cylindrical  
valve-seat so as to open or close the steam-  
25 port by oscillation about its axis, and having  
a longitudinal rectangular opening through it,  
and a loosely-fitting rectangular trunnion-bar

extending through it and journaled at its ends  
in trunnions adjustable by radial screws, in  
combination with springs F, so placed as to 30  
hold the valve down upon the bar, substan-  
tially as herein described.

4. A valve fitting a concave cylindrical  
valve-seat, and having a rectangular opening 35  
through it, a trunnion-bar extending through  
its interior, and having trunnions extending  
into the valve-chest covers, said covers being  
secured to the valve-chest by bolts of smaller  
diameter than the bolt-holes through the cov-  
ers, in combination with radial adjusting- 40  
screws, by which the covers may be moved and  
adjusted, substantially as herein described.

5. In a cylindrical valve fitting a corre-  
sponding valve-seat, and having a rectangu-  
lar opening for a trunnion-bar extending 45  
through it, the adjustable trunnions, as and  
for the purpose specified.

In witness whereof I have hereunto set my  
hand.

HANS C. BEHR.

Witnesses:

S. H. NOURSE,

C. D. COLE.