G. Sickels,

Balanced Valve,

No. 95,155. Patented Sep. 21. 1869.

Fig. 1.

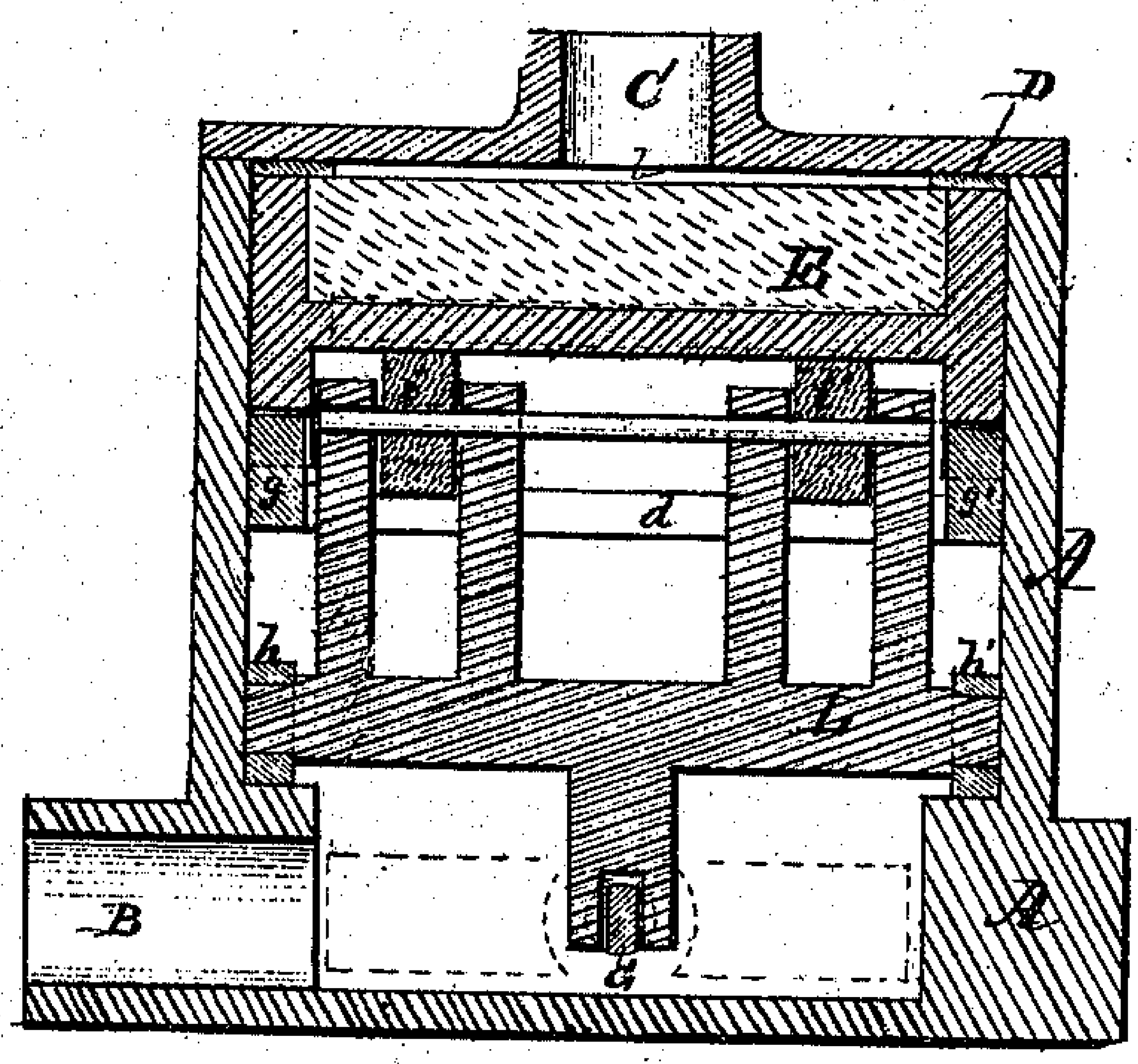


Fig. 2.

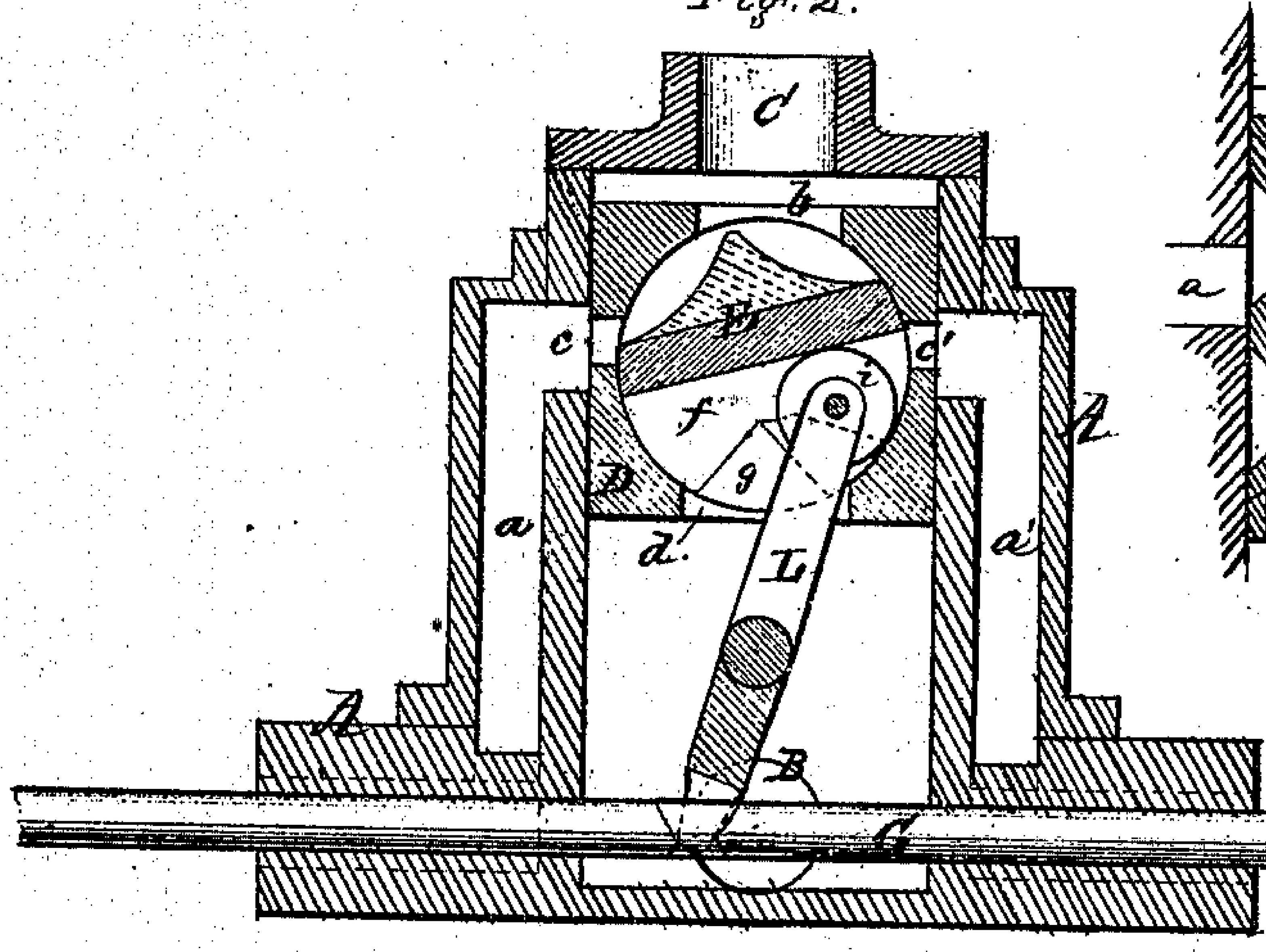
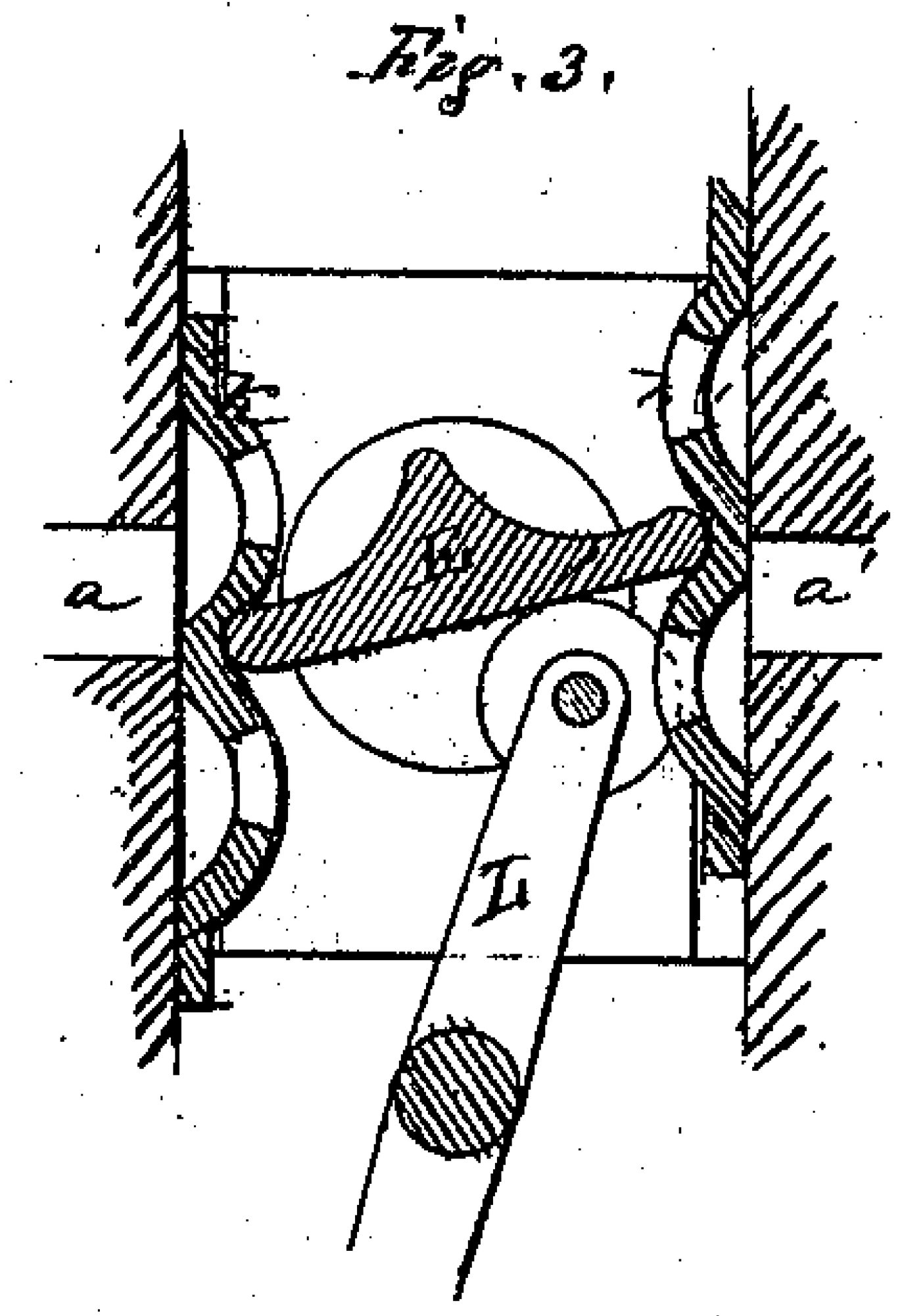


Fig. 3.



Witnesses.

Austin S. Howarth.

M. S. G. Wilde.

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United States Patent Office.

GERARD SICKELS, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 95,155, *dated September* 21, 1869.

IMPROVEMENT IN VALVES FOR STEAM AND OTHER ENGINERY.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, GERARD SICKELS, of Boston, in the county of Suffolk, and State of Massachusetts, have invented a new and improved Valve for Steam-Engines, Water-Wheels, Water-Meters, &c., of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, ing, making a part of this specification, in which—

Figure 1 is a longitudinal vertical section of the valve embodying my invention.

Figure 2 is a transverse vertical section of the same.

Figure 3 is a modification of same.

The same letters refer to the same parts in the different figures.

The object of my invention is to produce a simple and effective balance-valve, which opens and closes the ports quickly and automatically; and

My invention consists in a heavy plate with circular vertical ends, the upper portion of which is provided with two concave curved faces, the lower portion forming a straight surface. Said plate forms the valve, and vibrates within a sliding block, which latter moves and fits snugly within the valve-chest. The sliding block is provided with suitable ports, which correspond to those in the valve-chest.

My invention consists, further, in the valve-stem, acting on a double-arm lever, the longer or upper arms being provided with friction-rollers, which, by supporting the under surface of valve, hold or raise the same and the sliding block, by being operated by valve-stem toward the centre of sliding block.

My invention consists also in providing the lower portion of the vertical circular ends of valve with a recess, of such form and size as to correspond to pyramidical projections in the sliding block, and a space for the required movement of the valve, in such a manner, that when one side of the recess rests against one side of the projections, the edge of the valve will stop communication with the ports and the space below the valve, while it opens the space above the valve to the port. The opposite end will have the communications reversed.

Referring to the drawings—

A is the valve-chest, with exhaust-pipe B and passages *a a′* leading to the ends of the cylinder, and inlet-pipes C at the top of chest.

D is the sliding block, with cylindrical inside, and provided with openings *b d* and ports *c c′*.

The valve E fits snugly inside of sliding block D, and is supported with the circular ends *f* in corresponding openings of the latter.

g g′ are projections at the lower portion of the block D.

The valve-stem G operates on short arm of lever L, which is pivoted at *h h′*, while the longer arms are provided with rollers *i i′*, which act upon the lower face of valve E.

Operation.

Steam or water being admitted at C, will enter, through *b*, the sliding block D, and pass through port *c* and passage *a* into the cylinder, where it propels the piston, while the exhaust, passing through *a′*, port *c′*, into the block D, underneath the valve, will be removed through discharge-pipe B. The valve-stem G, now moving, will act upon lever L, and throw rollers *i i′* toward the centre of block D, thus raising the latter and valve. The further motion of roller *i* will allow the valve E to drop quickly toward port *c′*, until arrested by the sides of the recess in *f*, striking against the projections *g g′* of block D, thus reversing the position of the valve, and permitting the steam or water to enter through port *c′* into passage *a′*. But the roller must pass beyond the centre of the valve E before the pressure of steam, weight of water, &c., upon the upper side of the valve E, will cause the depression necessary to close the port.

By this means, it will be seen that advantages will be secured which cannot be found in other valves for accomplishing the rapid opening and cutting off of the motive-power.

The valve can be operated with little loss of power. It being a balance-valve, there is no pressure against sliding surface, nor are heavy weights or springs required for the quick action of the valve.

I do not confine myself to the exact construction of valve and sliding block, as herein explained, but it may be modified by substituting, for the sliding block, two sliding valves K K′, which are operated by the tilting of plate or valve E, as shown in fig. 3.

What I claim as new, and desire to secure by Letters Patent, is—

1. The balance-valve E, constructed substantially as herein described.

2. The valve E, in combination with sliding block D and valve-chest A, substantially as described.

3. The valve E, block D, chest A, in combination with lever L and valve-stem G, substantially as above specified.

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

GERARD SICKELS.

Witnesses:

CARROLL D. WRIGHT,

AUSTIN S. HOWARTH.