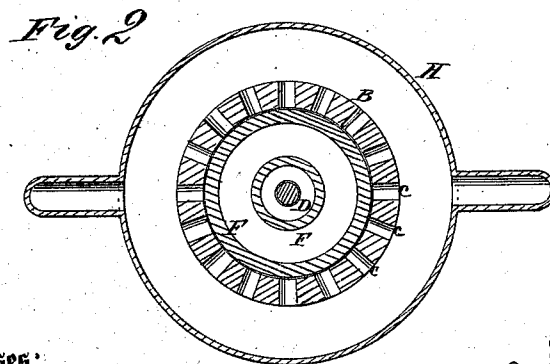
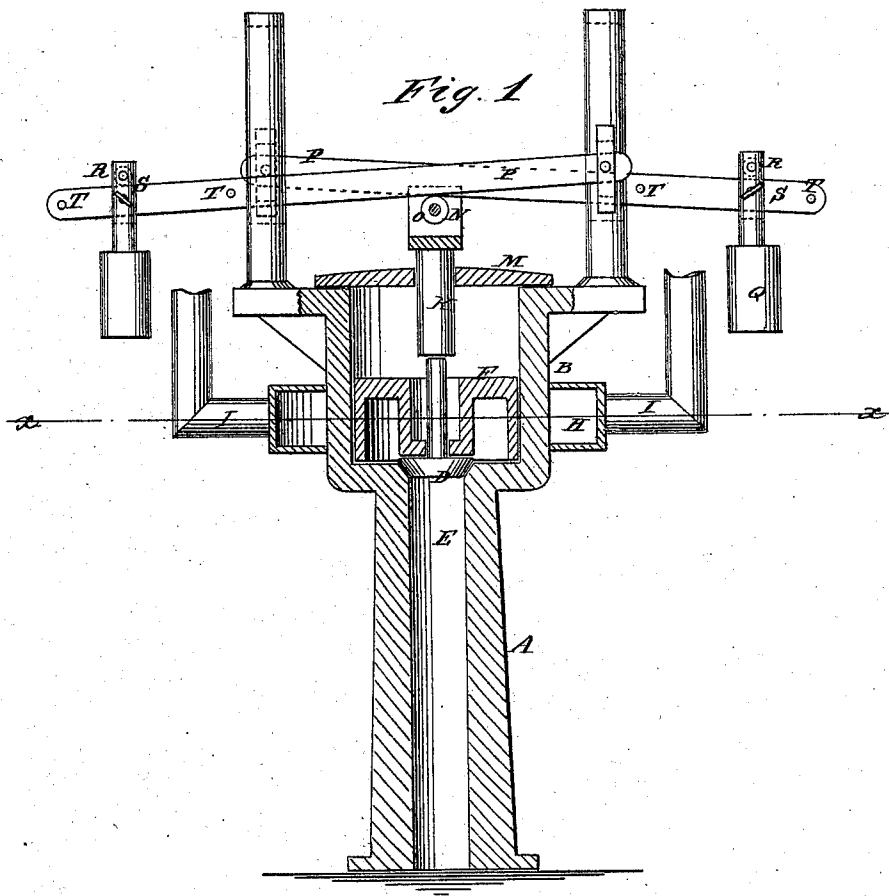


J. HOFFMAN.
Safety-Valves.

No. 143,825.

Patented Oct. 21, 1873.



Witnesses:

A. M. Almqvist
C. Edqvist

Inventor.

J. Hoffman
PER *Munnell*
Attorneys.

UNITED STATES PATENT OFFICE.

JAMES HOFFMAN, OF BELVIDERE, NEW JERSEY.

IMPROVEMENT IN SAFETY-VALVES.

Specification forming part of Letters Patent No. 143,825, dated October 21, 1873; application filed February 8, 1873.

To all whom it may concern:

Be it known that I, JAMES HOFFMAN, of Belvidere, in the county of Warren and State of New Jersey, have invented a new and Improved Safety-Valve, of which the following is a specification:

The invention consists in the improvement of safety-valves, as hereinafter described and pointed out in the claim.

Figure 1 is a sectional elevation of my improved safety-valve, and Fig. 2 is a horizontal section, the latter being taken on the line *x x* of Fig. 1.

Similar letters of reference indicate corresponding parts.

A is a short vertical pipe rising up from the top of the steam-chamber, having a considerable enlargement, B, near the upper end, which is bored out cylindrically, and, at a suitable distance above the bottom, perforated with numerous holes, C. D is the safety-valve proper, which is heated at the top of the small bore E of the pipe, and is provided with a cylindrical attachment, F, fitted to the bore of the part B, as nearly steam-tight as it can be and work up and down a short distance without friction, so that after the steam has lifted valve D it cannot escape until the attachment F rises as high as the lateral holes C, by which the lifting of the valve D high enough to insure the opening of the escape to the full capacity of the bore E will be insured, and thereby the disasters arising from an undue increase of pressure in the boiler while steam is blowing off, owing to the inability of the steam to open the valves sufficiently when arranged in the ordinary way, will be wholly and certainly avoided. The lateral openings at the side of the valve may be so regulated as to size that the supply from the bore will slightly exceed the issue from the opening. This will secure a uniform pressure of the steam, which will float the valve on its surface until the steam in the boiler will be reduced to less than half of the pressure which first raised the valve D. H is an annular receiver surrounding the

part B of the escape-pipe at the holes C, for receiving the steam, with one or more escape-pipes, I. The stem K, which will preferably be square or otherwise arranged so as to be held from turning, passes up through a cap, M, on the top of B, for a guide, and carries at the top two little rollers, N, in the same axis on a short horizontal shaft, O, whereon two weighted levers, P, rest, the said levers being reversed as to each other in respect of their fulcrums and weights, so that the lateral strain of each on the stem of the valve is balanced by the other, by which the valve-stem will not be sprung, bound, or cramped by them in any way.

This is a matter of more importance with a valve of this character which must have greater range than the ordinary valves, and would thereby be more liable to bind, &c., with one lever.

Another advantage due to this arrangement of two reversed weighted levers is that the boiler-shell is not strained unduly by the overhanging weight of the lever, which in the common arrangement, being all on one side, greatly strains the shell on one side of the steam-pipe.

I propose to have the weights Q hang from the levers by rollers R, so that they can slide along the levers freely when they are bound by set-screws S, which will be used to fasten them.

Stop-pins T will be applied to the levers to prevent the weights from going beyond the limit of the range at either end.

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

The enlargement B of the escape-pipe, with lateral escape-passages C above the seat of the safety-valve, and the valve F combined with the valve D, substantially as specified.

JAMES HOFFMAN.

Witnesses:

WILLIAM LEESE,
SIMON WADE.