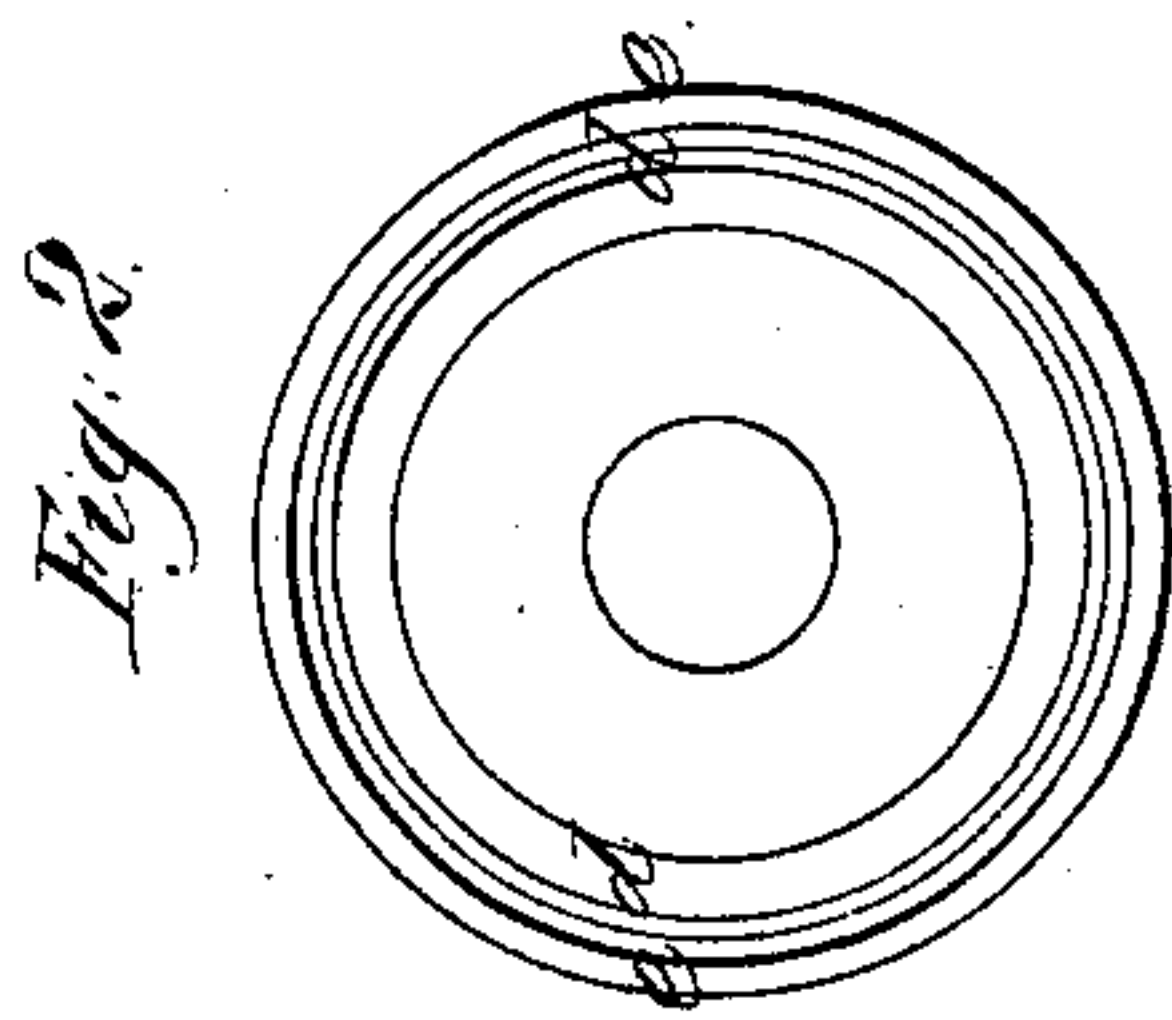
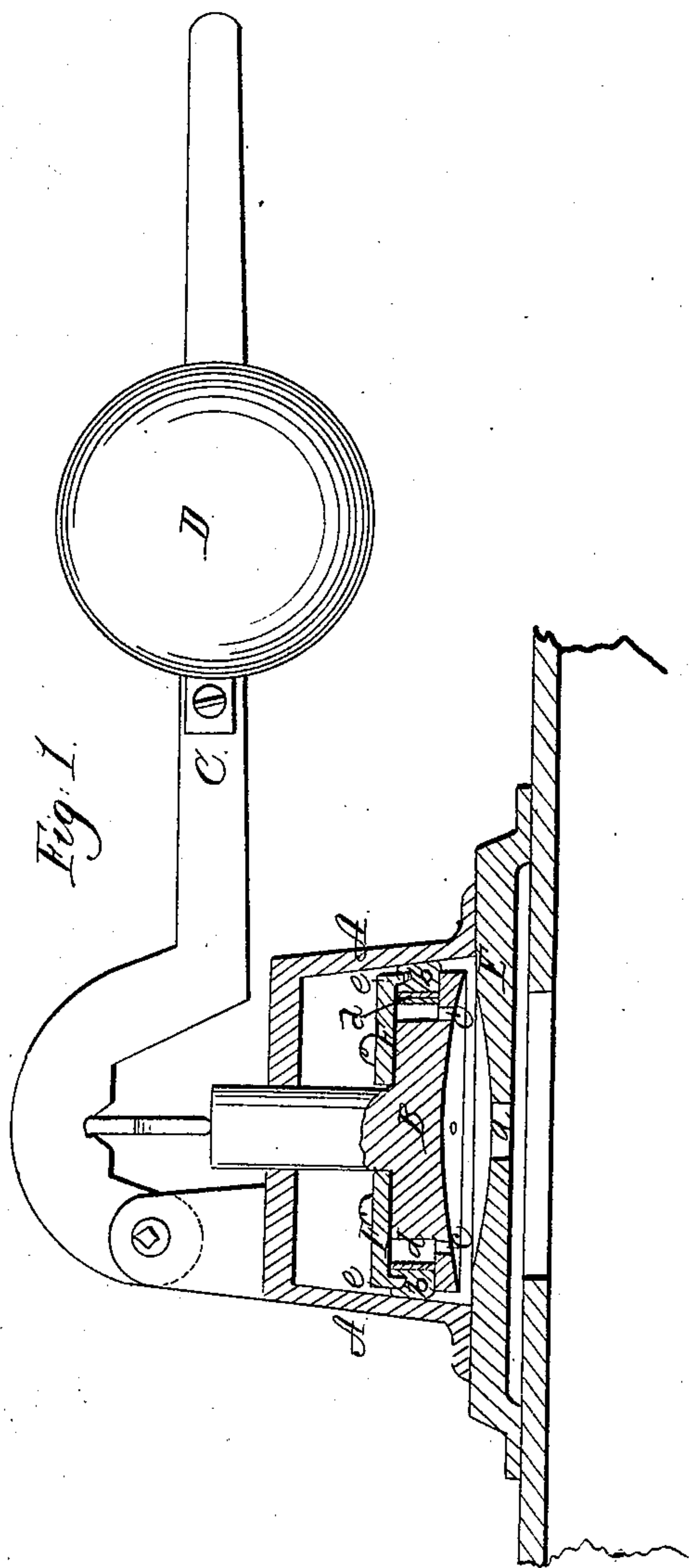


*W. S. Gale,*  
*Boiler-Furnace Draft-Regulator.*  
*N<sup>o</sup> 14,605.                      Patented Apr. 8, 1856.*



# UNITED STATES PATENT OFFICE.

WILLIAM S. GALE, OF NEW YORK, N. Y.

## PISTON-VALVE FOR STEAM-BOILER REGULATORS.

Specification of Letters Patent No. 14,605, dated April 8, 1856.

*To all whom it may concern:*

Be it known that I, WILLIAM S. GALE, of the city, county, and State of New York, have invented certain new and useful improvements in regulators for controlling the combustion of the fuel used for steam-boilers by the pressure of steam in the boiler; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, in which,—

Figure 1, is a section of a regulator constructed according to my invention. Fig. 2, is an inverted plan of the top plate of the piston and the packing spring.

Similar letters of reference indicate corresponding parts in both figures.

My invention consists in a certain method of clamping the packing of the piston of the regulator whereby it is caused to adapt itself to a tapered steam cylinder.

A, in the drawing represents the cylinder, which is secured to a base E, and receives steam at *a*, through a suitable pipe.

B, is the piston, C, the weighted lever connected with the damper and D the adjustable weight.

The piston is made slightly tapering to conform to the cylinder, but somewhat smaller, is packed with a packer *b, b*, of cotton, or other suitable substance, so applied as to be capable of expansion. The packing is forced out against the sides of the cylinder partly by the admission of steam into the piston through openings *e, e*, at the bottom, to act on its back side, and

partly by a spring or elastic steel ring (*d*). When the damper is open the piston is on its lowest position, where, the cylinder being larger, it fits as easily as is possible, without allowing the steam to pass it, the spring *d*, having at that time very little force, but as the pressure of steam overcomes the effect of the weight D, on the piston, and the piston rises, the packing is forced inward, and the contraction of the spring *d*, increases its force, and increases the friction of the piston, thus producing a gradual closing of the damper. When the pressure of steam diminishes the piston descends, first slowly, and gradually quicker. The piston opens and closes the damper with a comparatively short movement.

In order to prevent the steam that is admitted to the interior of the piston to force out the packing from passing through the packing at its junction with the upper part of the piston, I make the top plate F, of the piston with a small overhanging lip *e*, between which and the spring *d*, a portion of the packing is firmly and closely confined by the elasticity of the spring.

What I claim as my invention, and desire to secure by Letters Patent, is,

The lip, *e*, of the piston cap, F, and the spring, *d*, arranged in relation to each other and to the piston body for the purpose of clamping the packing, *b*, as herein set forth.

WM. S. GALE.

Witnesses:

JAMES F. BUCKLEY,  
WM. TUSCHE.