T. SHAW.

Noise-Quieting Nozzle.

No. 213,302. Patented Mar. 18, 1879.

Fig. 1.

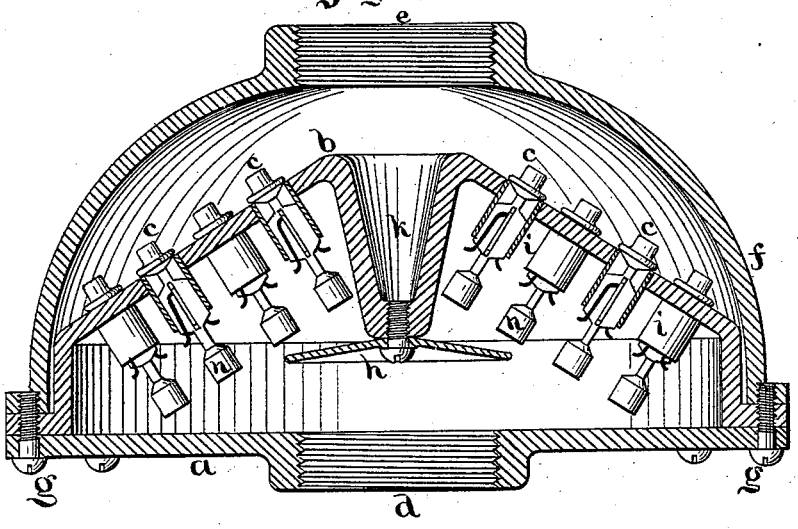


Fig. 3.

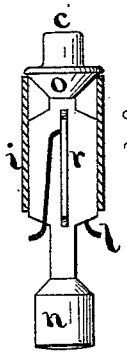
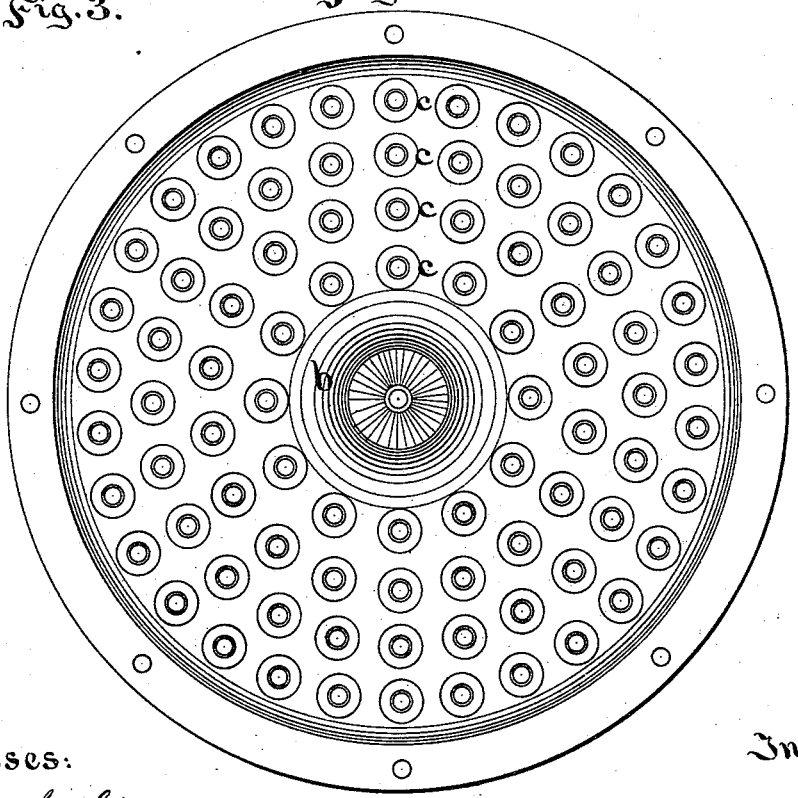


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

THOMAS SHAW, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN NOISE-QUIETING NOZZLES.

Specification forming part of Letters Patent No. **213,302**, dated March 18, 1879; application filed August 31, 1877.

To all whom it may concern:

Be it known that I, THOMAS SHAW, of the city and county of Philadelphia, Pennsylvania, have invented a new and Improved Noise-Quieting Nozzle; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists in the application of valve-surface to receiving-chamber for exhaust steam or air, and in the provision of numerous valves to procure a large area of outlet in the least possible space, and in mode of setting valves to prevent pounding, and also in the mode of preventing the blowing out of valves, and in providing a dash-plate, all for the purpose as hereinafter described.

The object of the invention is to quiet the noise of high-pressure escaping steam at any definite pressure in the receiving-chamber, predetermined by the weight of the valves.

In order to enable others to use and practice my invention, I will proceed to describe its construction and operation.

On reference to the accompanying drawings, which form part of this specification, Figure 1 is a vertical section through the center of apparatus. Fig. 2 is a top view of same with dome-cover *f* removed, and Fig. 3 a view of the valve and valve-seat.

Similar letters refer to similar parts, of which—

a is an iron disk-plate, provided with inlet-aperture *d*, for attachment to ordinary steam-pipe, and *b* is a cast-iron cone-plate, provided with numerous valves, *c*; and *f* is a cast-iron dome-cover, provided with outlet-aperture *e*, and the three cast plates are held firmly together by screws *g*.

The cone-plate *b* is bored with numerous holes for the reception of brass ferrules *i*, Fig. 3, which are driven firmly into the holes, and form a seat for the reception of valves *c*. The valves *c* are cone-shaped, as shown at *o*, and have wings *r* to guide the same, and also weight *n* to load them. A spring-catch wire, *l*, is passed through the stem, which is strong enough to prevent the blowing out of valve by steam, and weak enough to allow the valve to be pulled out by hand. *h* is a dash-plate, secured to cone-post *k*, by an ordinary screw. The dash-plate distributes the steam more evenly to the valves. The valves *c* are all set at an angle of thirty to forty degrees, more or less, according to weight of valve, to induce friction enough on the wings of the valves to prevent all pounding action.

The valves are made small to increase their number in a given area, in order that the largest possible area of outlet can be had in a contracted space with moderate lift of the valves.

The valves can be decreased in number by increasing their size to the desired extent; but this is not desirable, on account of the greatly-increased size and weight of the apparatus. The valves, all being weighted alike, blow off at the same pressure.

The large area of outlet permits large volumes of steam to pass through the valves, and causes the heavy vibrations to be absorbed within the chamber and upon the walls of the same, aided by the cushion of steam induced by the slight pressure caused by weight of the valves. This cushion of steam is an important element in all this class of noise-absorbing devices.

It will be evident that these valves can be variously fashioned and located in chambers of various shapes, and that springs may be substituted for the weights on the valves without any alteration in the result.

I therefore do not wish to confine myself to the exact construction of the valves or the chamber for receiving the same.

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

1. In noise-quieting nozzles, the valves *c* and the means of holding the same, in combination with an exhaust-receiving chamber, for the purpose of permitting the exhaust-steam to escape under a definite pressure without noise.

2. In noise-quieting nozzles, the valves *c*, placed at an angle to the vertical axes to cause friction, as described, and to form a steam-cushion by the weight of valves, substantially as and for the purpose set forth.

3. In noise-quieting nozzles, the combination of ferrule *i*, valve *c*, and spring-catch *l*, as described, for the purpose set forth.

THOMAS SHAW.

Witnesses:

WM. GARWOOD,

ELIAS J. SHAW.