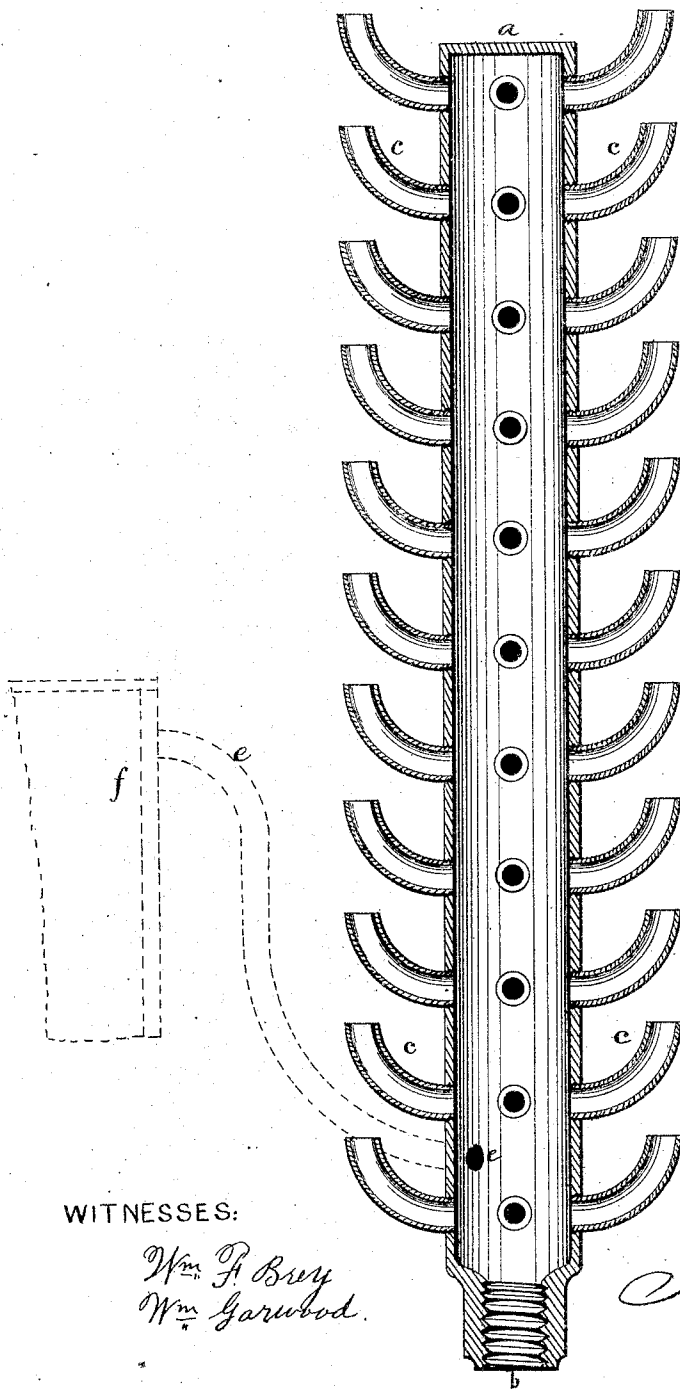


T. SHAW.
Exhaust-Nozzles.

No. 157,548.

Patented Dec. 8, 1874.



WITNESSES:

Wm. P. Bury
Wm. Garwood.

INVENTOR,

Thomas Shaw

UNITED STATES PATENT OFFICE.

THOMAS SHAW, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN EXHAUST-NOZZLES.

Specification forming part of Letters Patent No. **157,548**, dated December 8, 1874; application filed September 18, 1874.

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 mode of quieting the noise of high-pressure exhausts and steam blow-off; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

My invention consists in the construction and provision of numerous small or narrow passage-ways for steam or air, leading from the main exhaust-pipe, as hereinafter described.

The object of the invention is to lessen the noise of high-pressure engine-exhausts, steam blow-offs, &c.

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, the sketch represents a vertical section through the center of the exhaust-quieter, of which *a* is an ordinary tube, provided with a screw-thread on its lower end, *b*, for the purpose of attachment to exhaust-pipes of steam or air engines. *c c* are rows of small tubes screwed into the large tube *a*. The tubes *c* are all bent in an upward direction when it is desirable to produce a strong draft in smoke-stack from

the exhausts. *e* is a live-steam pipe leading from the boiler *f* and connecting with nozzle, for the purpose of creating artificial draft separate from the exhaust of engine, with all the advantages of the noise-quieter.

The object of the device is to consume all the heavy or sharp vibrations occasioned by the exit of high-pressure steam or air, by causing the vibrations to play first upon a rigid wall of metal, and allowing the steam or air to escape therefrom in small tubes or passage-ways that have not diameter sufficient to allow the escape of noisome sounds.

The draft occasioned by the exhaust steam in stacks will not be impaired by the use of this device, nor is the exhaust-pressure required to be greater, as the small passage-ways may have the same area of outlet as the exhaust-pipe.

It will be evident that the tubes or passage-ways may be variously fashioned without any alteration in the results.

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

The combination of the small tubes or narrow passage-ways *c* with the main exhaust chamber or tube *a*, for the purpose set forth.

THOMAS SHAW.

Witnesses:

WM. F. BREY,
WM. GARWOOD.