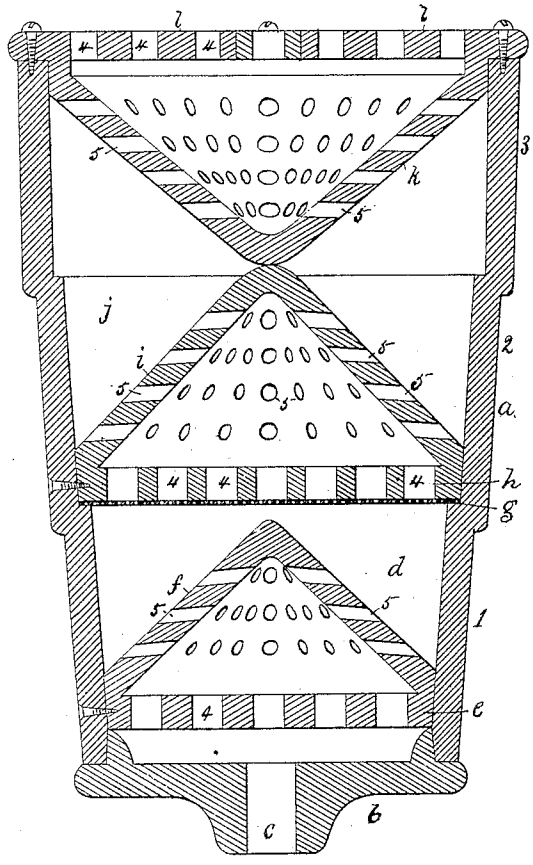
G. H. BUZZELL.

Device for Absorbing the Noise of Escaping Steam.

No. 199,512. Patented Jan. 22, 1878.




Witnesses.

E. C. Perkins.

W. J. Pratt.

Inventor.

George H. Buzzell

by Crosby Gregory Attys.

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# UNITED STATES PATENT OFFICE.

GEORGE H. BUZZELL, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HIMSELF AND FREDERIC E. STEVENS, OF SAME PLACE.

## IMPROVEMENT IN DEVICES FOR ABSORBING THE NOISE OF ESCAPING STEAM.

Specification forming part of Letters Patent No. **199,512**, dated January 22, 1878; application filed December 13, 1877.

*To all whom it may concern:*

Be it known that I, GEORGE H. BUZZELL, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Silencer for Steam-Engines, of which the following is a specification:

This invention relates to a silencer for exhaust-steam in connection with steam car-brakes and other exhaust-steam passages; and consists in a series of gradually-enlarging chambers, separated by means of pervious diaphragms, whereby the steam admitted into one chamber is allowed to expand, and then, after passing into another chamber through a pervious plate, it is again permitted to further expand, the steam passing from one to the other of the series of chambers, and being allowed, finally, to issue into the air. Checking the velocity of the steam in this way, breaking it up into small streams, and permitting it to expand, so checks its velocity that, when discharged into the air, it makes little or no noise.

The drawing shows, in section, a silencer constructed in accordance with my invention.

The silencer case or shell *a*, as shown, is made of three different diameters, as at 1 2 3; but instead of shaping it as shown, it may be made as a cone, or of other equivalent shape, to provide for a gradual increase of diameter of the case. This shell has a bottom plate, *b*, provided with an inlet, *c*, adapted to be connected with the end of the exhaust-pipe of the steam-brake or other steam-chamber.

Within the shell or its main chamber *d* are placed a main flat plate or diaphragm, *e*, and a main cone, *f*, each perforated, as at 4 5. Next beyond these in the shell is a metallic sieve-plate diaphragm, *g*, with a great number of fine holes, then the auxiliary perforated diaphragm *h* and the perforated cone *i*, it discharging its steam into the auxiliary chamber *j*; and in the larger portion of the chamber is placed the terminal cone *k*, and beyond it is the discharge-plate *l*, all these cones and plates being perforated with holes. The inlet *c* of this silencer is usually five inches in diameter, and in perforating the different plates or diaphragms and cones it is necessary only to keep in mind that the combined area of the openings in each plate and cone be equal to or in excess of the area of the inlet. The steam or air gradually expanded in the silencer between its entrance and exit is broken up, and its course is diverted and checked, and the steam is finally discharged under much reduced pressure.

I may use any desired number of layers of perforated strainer-plate, *g*, at any desired portion of the shell between its ends.

The exhaust-steam of the steam-brakes now commonly used makes a very loud and objectionable noise, which it is the object of this invention to reduce and prevent.

This device is equally desirable for an exhaust-silencer in an apparatus working with compressed air.

The cones are preferably provided with holes, the central lines of which are substantially at right angles to a central line drawn through the case or shell and the inlet *c*, the steam or air passing through them, thereby impinging against the sides of the case, and being finally discharged uniformly from the openings of the discharging-plate *l*.

It is obvious that these cones would operate to break up the direct course of the steam if placed in a cylindrical case.

I claim—

1. The case or shell of increasing area, in combination with a series of perforated diaphragms and cones, substantially as described.

2. The combination, with a shell or case of a silencer, of a series of cones, perforated as described.

3. In a silencer, a cone perforated with holes running at right angles to a line drawn longitudinally through the center of the case, substantially as described.

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

GEORGE H. BUZZELL.

Witnesses:

G. W. GREGORY,

F. E. STEVENS.