

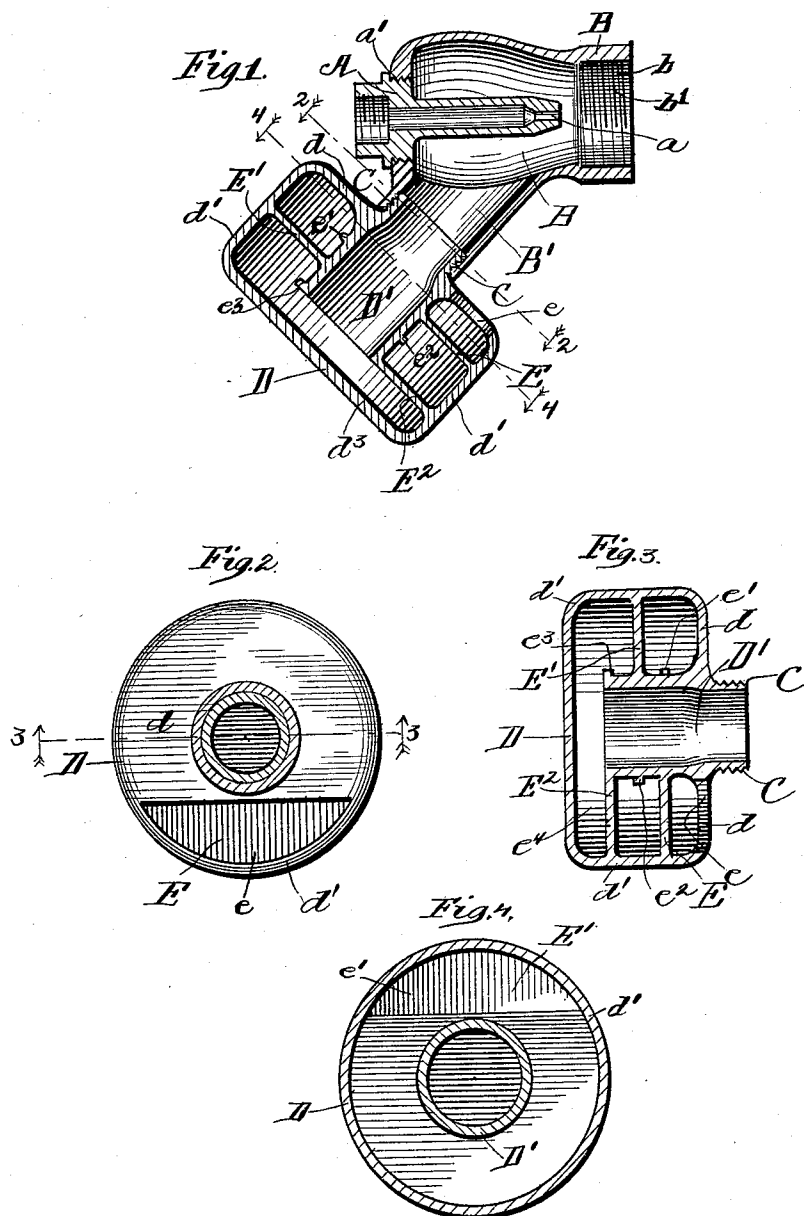
(No Model.)

R. D. SMITH.

SOUND ARRESTER FOR STEAM JET SMOKE PREVENTERS.

No. 463,606.

Patented Nov. 17, 1891.



Witnesses;
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UNITED STATES PATENT OFFICE.

ROBERT D. SMITH, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN SMOKE PREVENTER COMPANY, OF SAME PLACE.

SOUND-ARRESTER FOR STEAM-JET SMOKE-PREVENTERS.

SPECIFICATION forming part of Letters Patent No. 463,606, dated November 17, 1891.

Application filed July 20, 1891. Serial No. 400,037. (No model.)

To all whom it may concern:

Be it known that I, ROBERT D. SMITH, a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in a Sound-Arrester for Steam-Jet Smoke-Preventers, of which the following is a specification.

My invention relates to that class of smoke-preventers wherein a steam-jet pipe is inserted into a larger and surrounding pipe and the larger pipe attached to a steam-generator in such manner that when a jet or current of steam extends through the steam-jet pipe and into the fire-box of the steam-generator a current of air is also thrown into the fire-box, such current of air being induced by such steam-jet.

In devices of this character it has been found that the sound produced by the device, often of a whistling character, renders the use of the same extremely objectionable to those necessarily near and around the steam-generator having it therein.

The object of this invention is to construct a sound-arrester adapted to be attached to devices wherein an induced current of air is obtained by the use of a steam-jet in substantially the manner described; and it consists of the construction described in this specification and illustrated in the drawings attached hereto and forming a part hereof, wherein the induced current of air is, prior to its discharge with the steam-jet producing it, drawn through a series of connecting-chambers arranged to obtain a considerable distance of travel therefor, and the passages or ways formed by the openings in the several partitions or diaphragms between adjacent chambers being so arranged with relation to each other as to obtain sharp turns to such current of air.

In the drawings, Figure 1 is a vertical sectional view of a steam and air jet device and of a construction embodying my invention attached thereto; Fig. 2, a sectional view of my device on line 2 2 of Fig. 1, viewed in the direction of the arrows; Fig. 3, a sectional view on line 3 3 of Fig. 2, viewed in the direction of the arrows; and Fig. 4, a sectional view on line 4 4 of Fig. 1, also viewed in the direction of the arrows.

The same letter of reference is employed to indicate a given part when more than one view thereof is shown.

A is a steam-jet pipe adapted to discharge steam through nozzle *a* thereof. Steam-jet pipe A is adapted to fit into cap B. Cap B has neck B' thereon and discharge end *b* thereto.

Steam-jet pipe A is illustrated as fitted into cap B by screw-threads *a'* thereon, fitting into threads in cap B; but this method of attaching the steam-jet pipe A to cap B is not necessarily to be used, although well adapted therefor.

C are screw-threads surrounding the neck of the cylinder D of the sound-arrester. These screw-threads C engage with corresponding screw-threads in neck B' of cap B, and thereby the sound-arrester is secured to a steam-jet of the construction illustrated by the steam-jet A and cap B, having neck thereon; but where, as is preferably done by me, the cylinder D is cast integral with the neck B' and cap B, these screw-threads are not required, as in such case the neck B' extends down to the cylinder D of the sound-arrester and is joined thereto.

d is the front end wall of cylindrical part D of the device; *d'*, the cylinder forming the side wall thereof, and *d³* the rear end wall.

e is a hole or opening in the front end wall *d*.

E is a partition or diaphragm extending in a plane parallel with the front and back wall *d d³* of the sound-arrester and from the cylindrical wall *d'* to and around center discharge-tube D' of the sound-arrester.

e' is an opening in partition E, similar to opening *e* in front end wall *d*.

E' is a like partition or diaphragm as partition E, secured in a plane parallel with the plane in which partition E is secured.

e² is an opening through the diaphragm E'.

E² is a wall or diaphragm extending from cylindrical wall *d'* of the sound-arrester to and around the center discharge-tube D' and having therein opening *e³*.

The openings *e e' e² e³* in the several partitions are substantially alike and are for the purpose of forming a connecting-way from the chambers formed by the cylindrical side wall *d'* and the several partitions or diaphragms E E' E², respectively, and end wall *d³*.

By inspecting the drawings it will be seen

that air entering the opening *e* will pass into the first of the series of chambers and from thence forward and through opening *e'* into the adjacent chamber, from thence through opening *e²* into the next chamber, and from thence through opening *e³* into the last chamber, and from thence into the center discharge-tube *D'*, and so into the neck of the cap *B* and out of the discharge end *b'* of such cap.

It will be seen that the several openings through the partitions in the construction illustrated in Figs. 1 to 4, both inclusive, are so arranged as to obtain the longest path for the current of air extending through the cylinder practical with the size of the cylinder and the number of partitions employed, and that the several openings through the partitions or diaphragms are also arranged to give a sharp turn to such current of air as it extends from one chamber to the other and from the inner chamber into the discharge-pipe *D²*.

The several partitions are illustrated as being integral with the cylinder in which they are placed, and I prefer to so construct them, as I construct the device of cast metal, and the patterns are readily cored, so that the several positions can be readily cast integral with such cylinder.

These several partitions should be constructed of such material and so attached in position as to admit of but little, if any, vibration calculated to produce sound, but need not be integral with the cylinder in which they are placed.

It may be stated that the side walls of the several chambers through which the current of air is drawn, as described, need not be cylindrical in section, as illustrated in the drawings, but may be rectangular, octagonal, or many-sided, and that the number of chambers employed may be increased indefinitely, depending somewhat upon the area in cross-section of the chambers and the amount of air passing through therein; but I have so far

observed the best results when the device is embodied in a construction similar to that illustrated in Figs. 1 to 4, and I prefer such construction.

The holes through the adjacent partitions should, to obtain the best results, be as far removed from each other as possible—that is, on opposite sides of the cylinder in which the partitions are put; but good results are obtained as long as these holes are not opposite each other, and the air is thereby deflected in its movement through the chambers from a straight course. So much, however, as these holes fail of being as far apart as possible and the course of the current of air forced to make the sharpest possible deflection or turn, so far will the device fail to secure the best results obtainable.

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

In a sound-arrester for steam-jet smoke-preventers, the combination of side, top, and bottom end walls, partitions extending laterally across from and attached to the side walls forming chambers, holes arranged in such partitions, so that the hole through adjacent partitions shall not be opposite each other, a hole through the outer wall of the outside chamber, and a discharge-pipe extending longitudinally from the inner one of the several connecting-chambers to and beyond the outer end wall of the outside chamber and adapted to connect with the pipe surrounding a steam-jet nozzle, whereby the induced current of air created by the steam-jet from the nozzle is drawn through the series of chambers before extending into the fire-box of the steam-generator to which the device is attached, substantially as described.

ROBERT D. SMITH.

In presence of—

ARNOLD BUCHER,
CHARLES T. BROWN.