J. KIRKLAND.
Spark Arrester.

No. 201,685. Patented March 26, 1878.

Fig. 1.

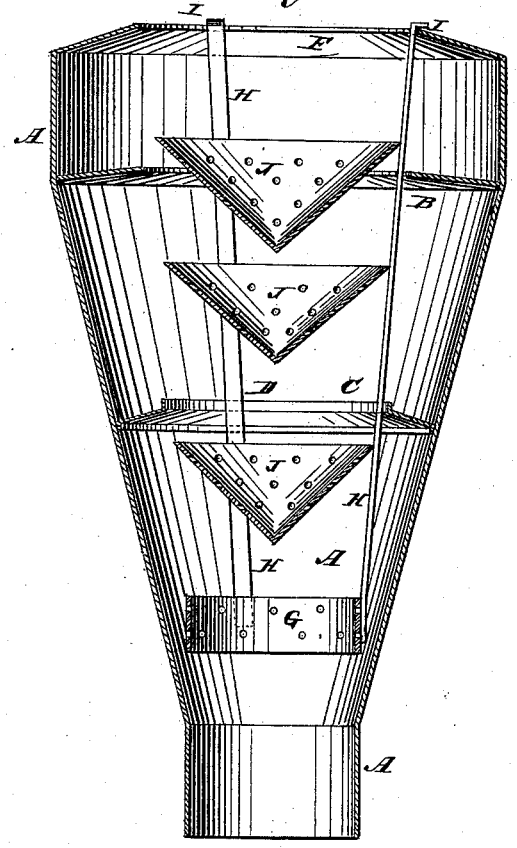
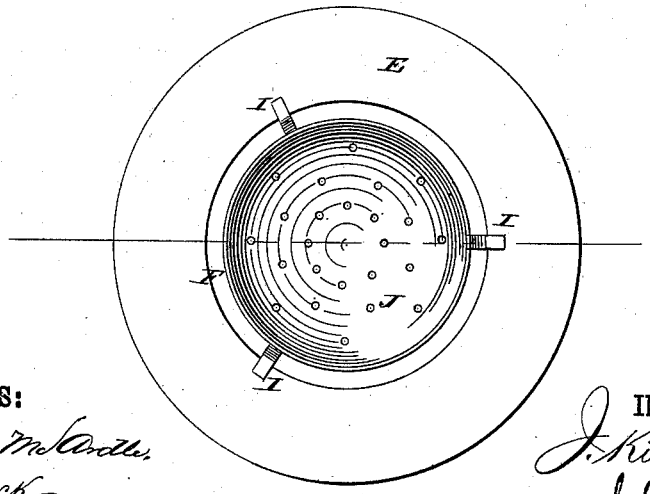


Fig. 2.



WITNESSES:
Francis. McArdle.
C. Sedgwick

INVENTOR:
J. Kirkland
BY Munn & Co
ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN KIRKLAND, OF MENOMONEE, WISCONSIN.

IMPROVEMENT IN SPARK-ARRESTERS.

Specification forming part of Letters Patent No. **201,685**, dated March 26, 1878; application filed December 28, 1877.

To all whom it may concern:

Be it known that I, JOHN KIRKLAND, of Menomonee, in the county of Dunn and State of Wisconsin, have invented a new and Improved Spark-Arrester, of which the following is a specification:

This invention relates to that class of spark-arresters in which plates, disks, or other devices are placed, or chambers formed within the chimney, smoke-pipe, or stack, for the purpose of producing eddies, or otherwise detaining the sparks until consumed or extinguished.

The invention will first be described in connection with the drawing, and then pointed out in the claims.

In the drawings, Figure 1 is an elevation of a smoke-stack or chimney embodying my invention. Fig. 2 is a plan of same.

Similar letters of reference indicate corresponding parts.

A is the shell; B, the upper annular diaphragm; C, the lower diaphragm; D, vertical rim of lower diaphragm; E, the top; F, escape-opening through the top; G, perforated cylinder; H, suspension-rods; I, upper ends of suspension-rods; J, perforated cones.

The shell is made of the form usual in locomotive smoke-stacks—an inverted cone, connecting a cylindrical throat with a much larger cylindrical discharge end.

The central openings through the top and diaphragms slightly exceed in diameter the perforated cones and cylinder, sufficiently to permit the easy removal and replacing of the suspension-rods with the cones and cylinder attached. The rods are bent over at their upper extremities to catch or rest on the inner rim of the top, and thereby sustain the weight of the diaphragms and cylinders suspended by them. They may be readily bolted to the top for locomotives or marine-boilers; but the suspended weight will be sufficient to hold them down for stationary boilers. The smoke in passing through this stack impinges against the perforated cylinder, the shell and the under side of the cones and diaphragms tending to extinguish or retain the solid matter, while the gases escape.

The sparks dropping into the inverted cones are consumed or extinguished before escaping from the stack.

The perforations permit the entrance of gases from below, and keep the sparks in motion within the cones; but the motion or current being less within the cones than without, the sparks are arrested in the resulting eddies.

The perforations in the cones make them so much more effective that, to produce the same result in arresting sparks, the draft is impeded less than by ordinary spark-arresting devices, both while getting up steam and while keeping it up.

I have employed the perforated cones with the open end or base downward; but I find that the practical result is very much more satisfactory when the open end or base is upward, as shown in the drawings.

A deposit of the unconsumed solid matter or sparks is made on the upper surface of the diaphragms, which accumulation can be removed when the fire is out, or when the cones are removed for the same purpose. The rim D may be used on either or all the diaphragms to increase the capacity of retaining the sparks.

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

1. The combination, in smoke-stacks or chimneys, of perforated cones J and annular diaphragms B and C, with or without rims D, in a manner substantially as described, and for the purposes set forth.

2. Shell A, annular diaphragms B and C, rim D, top E, opening F, perforated cylinder G, rods H, ends I, and cones J, constructed, combined, and operating in a manner substantially as described, and for the purposes set forth.

JOHN KIRKLAND.

Witnesses:
CHARLES N. RELPH,
THOMAS W. VANCE.