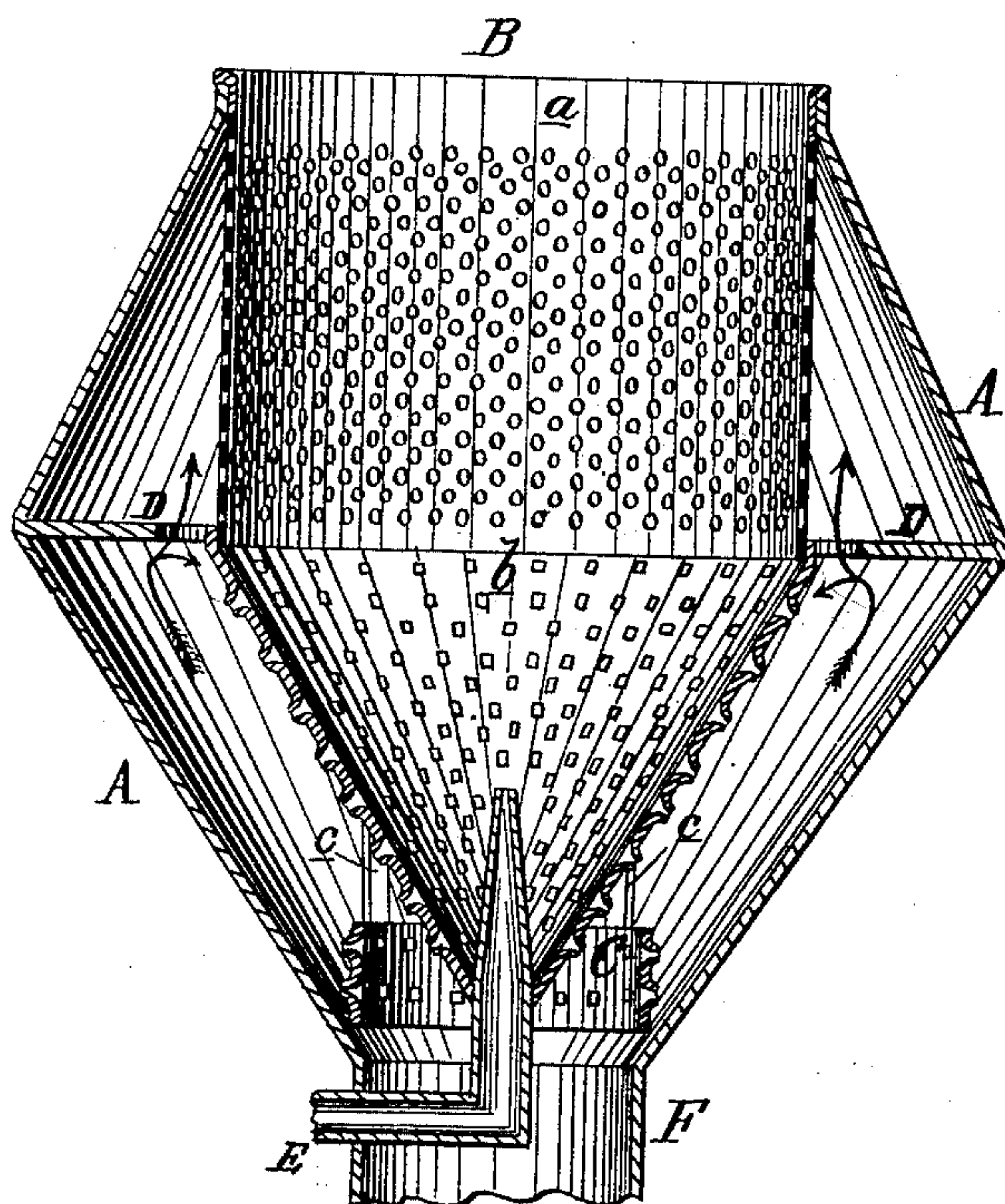


J. KIRKLAND.  
Spark-Arrester.

No. 223,362.

Patented Jan. 6, 1880.



WITNESSES:

*Henry N. Miller*  
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INVENTOR:

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# UNITED STATES PATENT OFFICE.

JOHN KIRKLAND, OF MENOMONEE, WISCONSIN.

## SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 223,362, dated January 6, 1880.

Application filed October 27, 1879.

*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.

The drawing represents a vertical sectional elevation of the device.

This invention relates to that class of spark arresters in which plates, disks, or other devices are placed within the smoke-stack for the purpose of detaining the sparks and cinders until they are consumed or extinguished.

In the drawing, A represents the shell; B, the pocket, composed of the smooth perforated ring *a* and the rough perforated cone *b*. C is the narrow perforated ring connected with the cone *b* by rods *c*. D is the annular diaphragm. E is the steam-pipe that leads from the boiler, and F represents the smoke-stack to which the spark-arrester is attached.

The admission of steam from the boiler into the pipe E, and thereby the draft up through the spark-arrester, can be regulated by the engineer from the cab of the locomotive without interfering with the fire doors or dampers.

The exhaust-pipes can be tapped at or near exhaust-nozzles, and a pipe leading from each exhaust-pipe is to be connected with pipe E (leading from boiler) or run directly into the pocket independent of pipe E, thus using a part of the exhaust-steam to form a suction inside the pocket, and the balance of exhaust-steam will form a draft outside of the pocket. Pipe E from the boiler (either or all of the pipes from the exhaust-pipes or all in combination) can be used, as required. The heavier the engine labors the better this draft from the suction and exhaust pipes; consequently steam can be made easier and quicker.

The upward suction caused inside of the pocket B, into which the pipes E and pipes from exhaust-pipe extend, and the exhaust created on the outside of the said pocket B by the steam issuing from the exhaust-pipe, cause the sparks and cinders that escape from the fire-box of the locomotive to come in contact with the rough surfaces of the ring C and cone

*b* with such force that they, or most of them, (the sparks and cinders,) are broken up and extinguished, and thereby rendered harmless.

The perforations in the rings *a* and C and cone *b* permit the free passage of the smoke and gases from the fire, but are not large enough to permit the passage of the large fragments of burning coal or cinders, whose escape is attended with so much danger.

The perforated ring *a* in pocket can be made in sections, one or more of which can be taken out and the space be supplied with rods or braces, thus leaving an open space for a more natural draft for such stacks as do not have exhaust-steam to force the draft.

The cone *b* and ring C are preferably punched with square holes, as shown in the drawings, and the ragged edges of the holes made to protrude outward as much as possible to offer a rough surface for the sparks and cinders to impinge against, so that they may be the more quickly broken and extinguished.

The annular diaphragm E serves to deflect the rising cinders and sparks upon or against the pocket B in the direction of the arrows, and serves also to stiffen and strengthen the shell A.

The opening in the discharge or upper end of the shell A and perforated ring *a* may be enlarged or reduced to suit the purposes to which the device is adapted, for this device may be applied to marine-boilers as well as to those used on land.

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

1. The combination of shell A, pocket B, ring C, and diaphragm D, all constructed and arranged substantially as herein shown and described.

2. In a spark-arrester, the shell A, pocket B, ring C, diaphragm D, and steam-pipe E, in combination, all arranged substantially as herein shown and described.

JOHN KIRKLAND.

Witnesses:

S. D. MCKAHAN,  
ELMER J. NEWSOM.