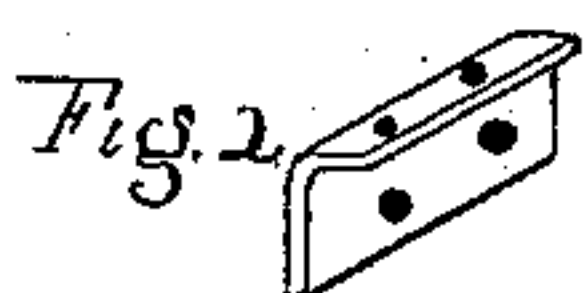
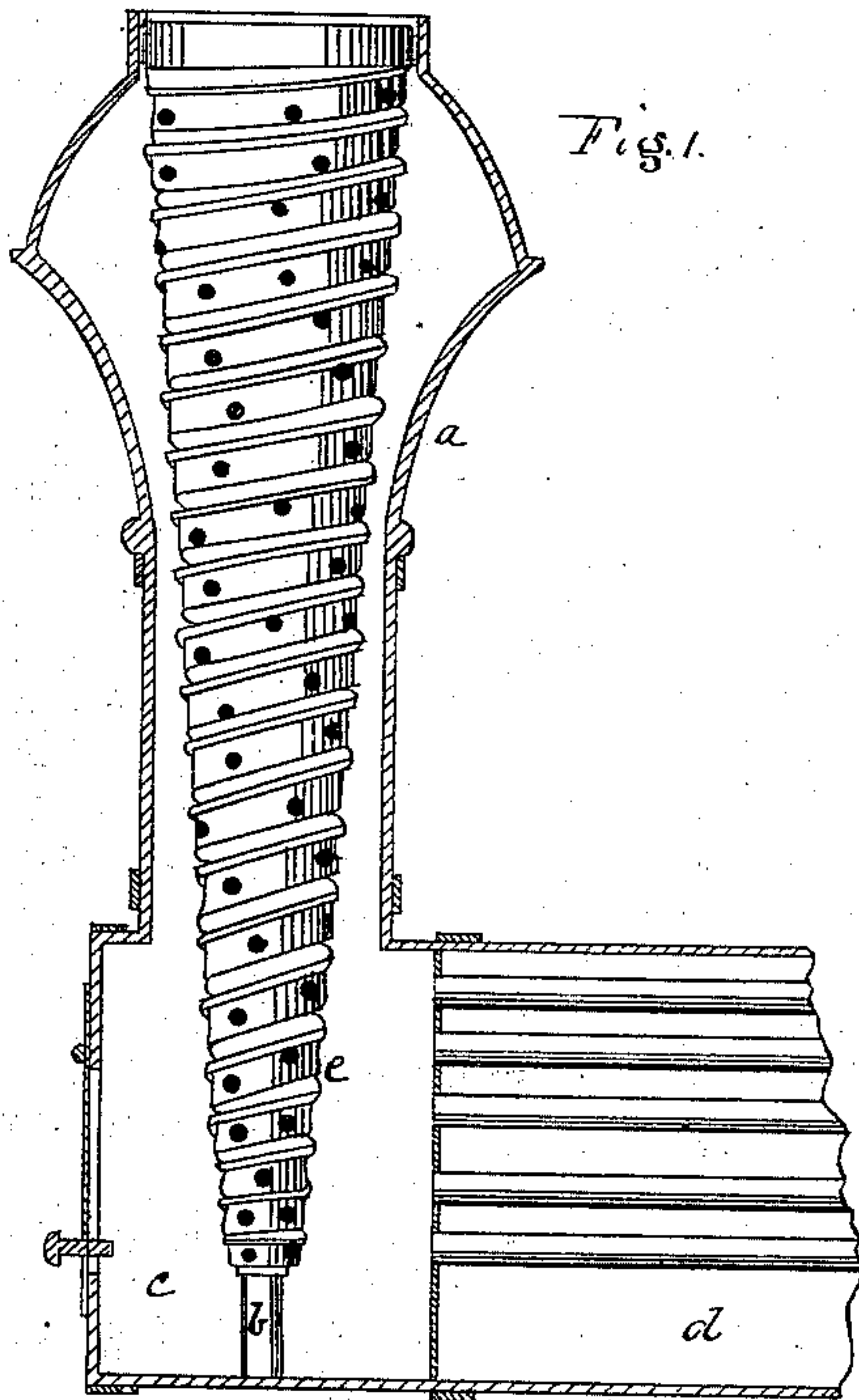


J. McLANE.  
Smoke-Stacks.

No. 154,560.

Patented Sept. 1, 1874.



WITNESSES

James E. Kay  
Frederick Standish

INVENTOR

James McLane  
by Bakewell & Allen  
attorneys

# UNITED STATES PATENT OFFICE.

JAMES McLANE, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO HIMSELF  
AND MICHAEL ZECK, OF SAME PLACE.

## IMPROVEMENT IN SMOKE-STACKS.

Specification forming part of Letters Patent No. **154,560**, dated September 1, 1874; application filed  
May 25, 1874.

*To all whom it may concern:*

Be it known that I, JAMES McLANE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Smoke-Stack; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing forming a part of this specification, in which—

Figure 1 is a vertical section of a smoke-stack and smoke-box with a portion of the boiler of a locomotive-engine, showing my improvement and illustrating its application; and Fig. 2 is a portion of the coil.

My invention relates to the construction of an improved spark-arrester; and it consists of a cone-shaped grating extending from the exhaust-nozzle to the mouth of the stack, formed, preferably, of angle-iron coiled spirally and in such a way as to form a cone, and provided with openings or perforations through the flanges of the angles, the general form adopted being that of a cone with the apex downward, and inclosing the exhaust-nozzle, the cone surrounded by a spiral flange to deflect the sparks escaping through perforations in the cone.

To enable others skilled in the art to make and use my improvement I will describe it more fully.

In the drawing, *a* represents the stack of a locomotive; *b*, the exhaust-nozzle; *c*, the steam-box, and *d* the boiler. *e* is the cone, constructed, as before described, of angle-iron coiled spirally. This cone extends from the exhaust-nozzle to the mouth of the stack, so as to form a free passage for the exhaust directly upward. The tapering sides of the cone extend from the comparatively small point at

the end of the exhaust-nozzle outward until at the upper end it entirely closes or extends across the smoke-discharge. The exhaust causes the smoke to be drawn through the perforations, and also the interstices formed by the coiling of the iron.

The sparks or cinders, striking against the laterally-projecting flange of the angle-iron, are completely broken up and cast back in the smoke-box; and when at last, after repeated pulverization, they are drawn through and discharged, they are so small that the contact with the outer air extinguishes them immediately.

By protecting the exhaust from the direct impact of the smoke and cinders from the fire-box, and giving it a clear passage directly through the stack, I am enabled to enlarge the exhaust-nozzle, and thereby to reduce the force of the exhaust. In this way I prevent the drawing through the flues of large cinders, and thereby very materially lessen the combustion without reducing the heat.

If desired, the cone may be formed of flat iron, surrounded by a spiral flange, and perforated, instead of angle iron; but I prefer the former construction.

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

The spark-arrester consisting of a perforated cone surrounded by a spiral flange or deflector, in combination with the exhaust, substantially as specified.

In testimony whereof I, the said JAMES McLANE, have hereunto set my hand.

JAMES McLANE.

Witnesses:

T. B. KERR,  
E. C. FITLER.