A. O. DENIO.
Spark-Arrester.

No. 199,521. Patented Jan. 22, 1878

Fig. 1.

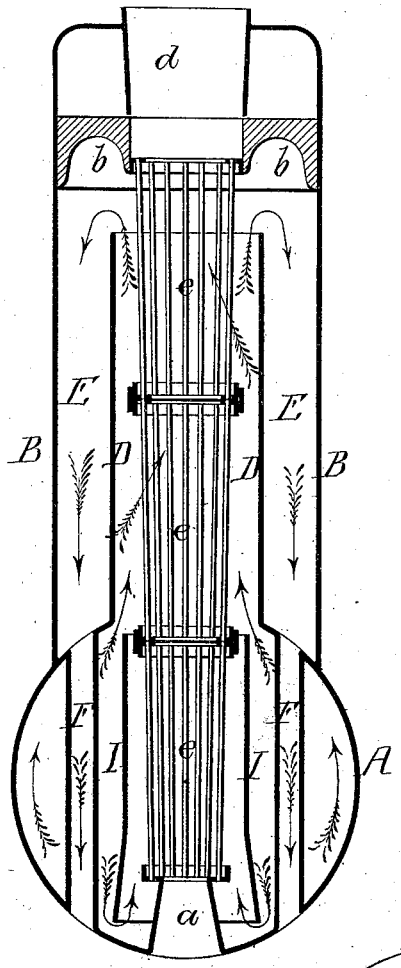


Fig. 2.

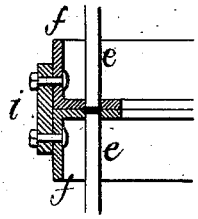
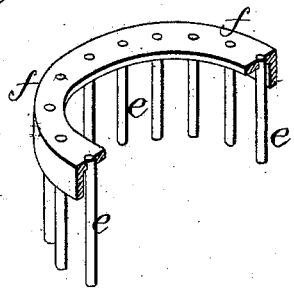


Fig. 3.



Witnesses
John McNamara
Harry Smith

Inventor
Asa O. Denio
by his Attorneys
Howson and Howson

UNITED STATES PATENT OFFICE.

ASA O. DENIO, OF WILMINGTON, DELAWARE, ASSIGNOR OF ONE-HALF HIS RIGHT TO THE LOBDELL CAR WHEEL COMPANY, OF SAME PLACE.

IMPROVEMENT IN SPARK-ARRESTERS.

Specification forming part of Letters Patent No. **199,521**, dated January 22, 1878; application filed November 26, 1877.

To all whom it may concern:

Be it known that I, ASA O. DENIO, of Wilmington, Delaware, have invented a new and useful Improvement in Spark-Arresters, of which the following is a specification:

The object of my invention is to construct a cheap and effective spark-arrester which can be easily repaired—an object which I attain in the following manner, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section of my improved spark-arrester, and Figs. 2 and 3 enlarged sectional views of parts of the same.

A is the smoke-box end of a locomotive-boiler, and B the stack, the latter being considerably larger in diameter than usual, so as to contain an inner tube, D, between which and the stack intervenes an annular chamber, E, communicating at the bottom with pipes F, which pass through the smoke-box, and which may communicate with any suitable receptacle.

The interior of the tube D communicates at its lower end with the smoke-box of the boiler, and at the top with the annular space E, and within the smoke-box and tube is arranged the spark-arresting screen, which extends from the blast-pipe *a* at the bottom to a ring, *b*, at the top, said ring having a deep groove on the under side, as shown in Fig. 1.

From the ring *b* to the top of the stack extends a short tube, *d*, which, at its lower end, is of the same diameter as the central opening of the ring.

The spark-arresting screen consists of a number of sections—three in the present instance—each section being composed of a number of rods or bars, *e*, adapted at each end to openings in a ring, *f*, these rings being formed of angle-iron, so that the adjoining rings of adjacent sections may be fastened together by riveting or otherwise, securing them to an encircling ring or band, *i*, as shown in Fig. 2.

In order to counteract as far as possible the effects of wear, I prefer to make the bars *e* of hardened steel, and the rings *f* and bands *i* of steel or chilled iron.

The lower portion of the screen—that is, the portion within the smoke-box—is surrounded by a tube, I, which extends to within a short distance of the top and bottom of the smoke-box.

The forcible jets of steam entering the interior of the screen from the exhaust-pipe *a* cause the products of combustion to pass upward from the smoke-box into the tube D, either directly or up through the tube I, as indicated by the arrows.

The gaseous products, together with the small sparks, pass between the bars of the screen, ascend within the same, and are discharged through the tube *d* at the top of the stack.

Ignited particles of fuel which are so large as to be dangerous if thrown from the stack cannot pass between the bars of the screen, but are carried up outside the same and projected against the grooved under side of the ring *b*, which deflects them into the annular chamber E, and from the latter they escape through the pipes F either onto the track beneath the locomotive or into some receptacle, where they can be extinguished and then discharged.

The advantages of the improved spark-arresting screen above described, as regards its adaptability to smoke-stacks of varying heights, and the readiness with which it can be repaired when any of the parts become worn or need replacing from any other cause, will be evident without further description.

I claim as my invention—

1. A spark-arresting screen composed of sections, each of which consists of a series of bars and retaining-rings, affording protection for the ends of the said bars, all as set forth.

2. The combination of the bars *e*, angle-iron rings *f*, and encircling-band *i*, as specified.

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

ASA O. DENIO.

Witnesses:

WM. W. PRITCHETT,

JNO. HENRY PUHL.