A. MITCHELL.

SPARK-ARRESTER.

No. 178,181. Patented May 30, 1876.

Fig. 1.

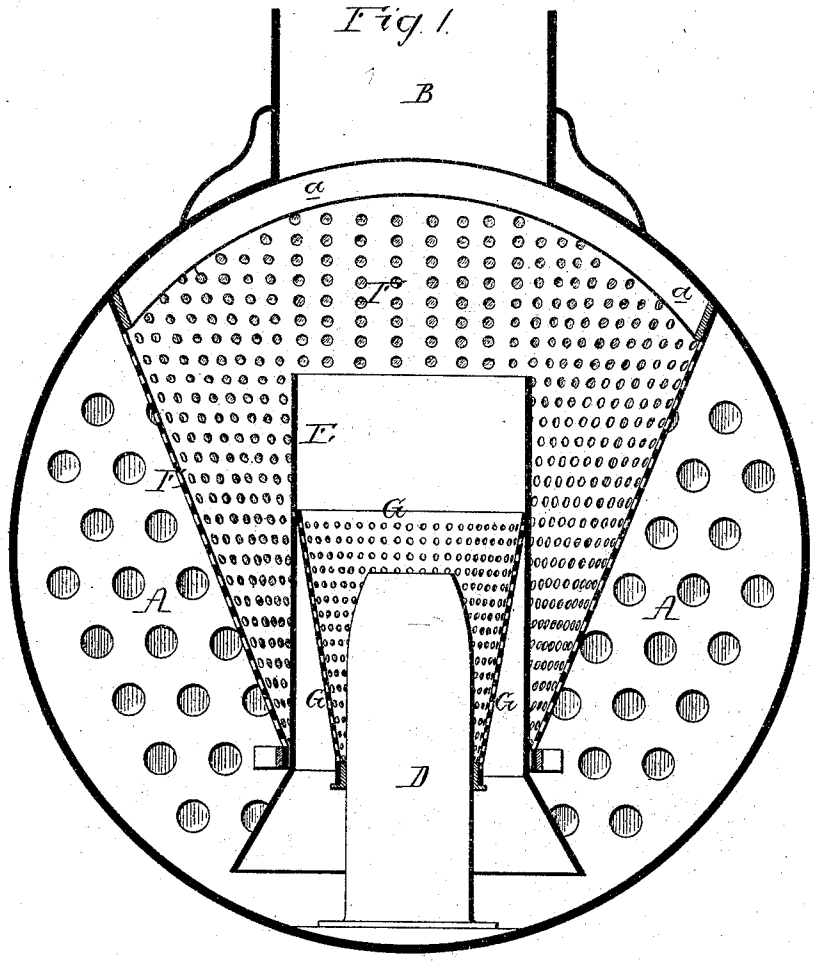
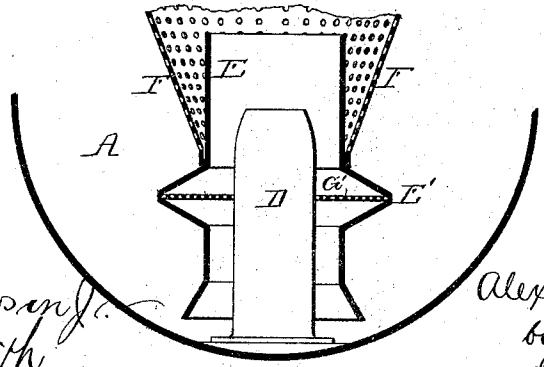


Fig. 2.



Witnesses,
Harry Hoyson Jr.
Harry Smith

Alexander Mitchell
by his Attorneys
Howson & Sons

UNITED STATES PATENT OFFICE.

ALEXANDER MITCHELL, OF WILKESBARRE, PENNSYLVANIA.

IMPROVEMENT IN SPARK-ARRESTERS.

Specification forming part of Letters Patent No. **178,181**, dated May 30, 1876; application filed April 26, 1876.

To all whom it may concern:

Be it known that I, ALEXANDER MITCHELL, of Wilkesbarre, Luzerne county, Pennsylvania, have invented an Improved Spark-Arrester, of which the following is a specification:

The object of my invention is to so construct a spark-arrester for locomotives that the complete reduction and disposal of the sparks is effected without obstructing the draft; and this object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawing, in which—

Figure 1 is a transverse section of my improved spark-arrester, and Fig. 2 a view of a modification.

A is the smoke-box of a locomotive; B, the stack, and D the usual exhaust-pipe projecting up into the smoke-box from the bottom. Surrounding this pipe is a vertical tube, E, of somewhat greater diameter than the exhaust-pipe, and this tube is preferably flared at its lower end, and projects down to within a short distance of the bottom of the smoke-box. Surrounding the upper portion of the tube E is a screen, F, of wire-gauze or perforated plate, and made in the shape of an inverted frustum of a cone, the lower end of this screen embracing the tube E near its lower end, and the upper end of the screen being secured to a rib, *a*, formed on the upper portion of the smoke-box casing, and surrounding the mouth of the stack. Within the tube E is arranged a perforated screen, G, also made in the shape of an inverted frustum of a cone, the upper end of this screen being secured to the interior of the tube, and its lower end embracing the exhaust-pipe D.

The products of combustion enter the smoke-box from the flues, and the smoke and small sparks pass directly through the openings of the screen F and out through the stack. Particles of such large size that they would be dangerous if thrown from the stack strike the screen, however, and, being too large to pass through the openings of the same, fall into the bottom of the smoke-box, and are drawn up into the tube F and thrown forcibly against the screen G. The greater portion of the sparks are so disintegrated by this treatment that they pass directly through the openings of the screen; but those portions which are still too large fall, and are again and again forced against the screen G until reduced to the proper size.

By the above-described arrangement an extended screen-surface is presented, and a free passage for the smoke and small sparks afforded, while the escape of the exhaust-steam is entirely unobstructed.

In Fig. 2 a modification of my invention is shown, in which the tube E is increased in diameter at E′, and a horizontal screen, G′, adapted to this enlarged portion, is used in place of the inclined screen shown in Fig. 1.

I claim as my invention—

The combination, in a spark-arrester, of the exhaust-pipe D, the tube E, the lower end of which extends nearly to the bottom of the smoke-box, with the screen F, arranged outside the tube E, and extending from the lower portion of the same to the top of the smoke-box, and the screen G, interposed between the pipe D and the tube E, all substantially as set forth.

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

ALEXANDER MITCHELL.

Witnesses:

EDMUND G. BUTLER,

GEO. A. WELLS.