A. MITCHELL.

Locomotive Spark-Arrester.

No. 160,456. Patented March 2, 1875.

FIG. 1.

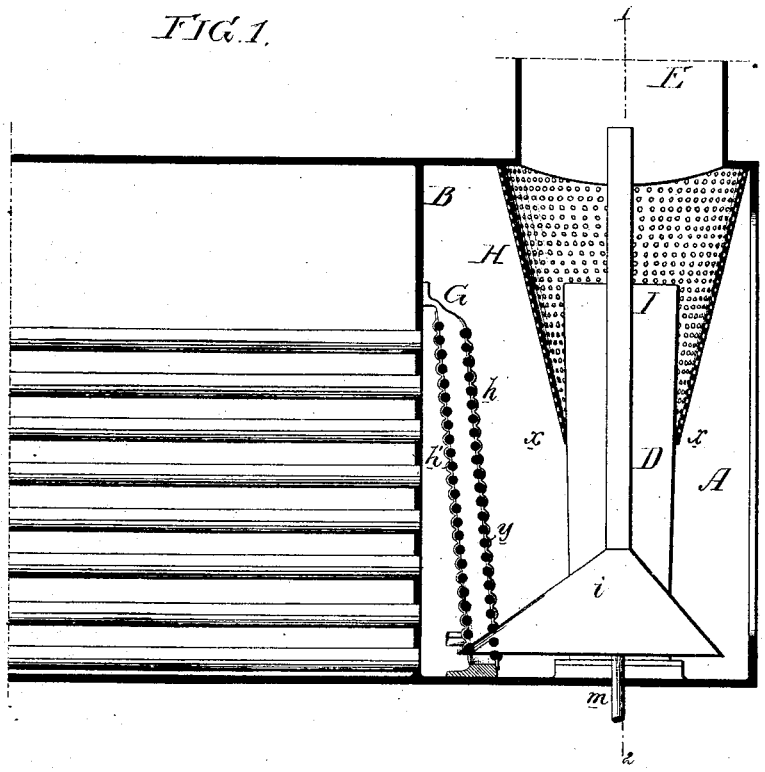


FIG. 5.

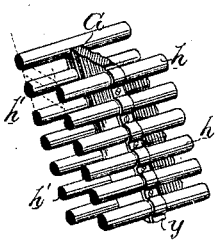
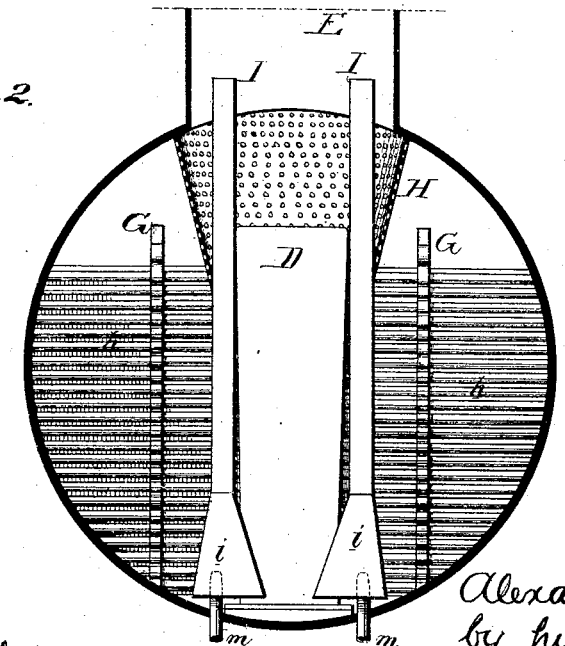


FIG. 2.



Witnesses, Hubert Howson
Thomas McElwain

Alexander Mitchell
by his Attorneys
Howson and Sons

UNITED STATES PATENT OFFICE.

ALEXANDER MITCHELL, OF WILKESBARRE, PENNSYLVANIA.

IMPROVEMENT IN LOCOMOTIVE SPARK-ARRESTERS.

Specification forming part of Letters Patent No. **160,456**, dated March 2, 1875; application filed January 15, 1875.

To all whom it may concern:

Be it known that I, ALEXANDER MITCHELL, of Wilkesbarre, Luzerne county, Pennsylvania, have invented certain Improvements in Spark-Arresters for Locomotives, of which the following is a specification:

The objects of my invention are, first, to make a durable and efficient screen, to be placed in the smoke-box of a locomotive-boiler, for thoroughly disintegrating the sparks as they are projected from the tubes; second, to prevent the accumulation of sparks in the smoke-box.

These objects I attain in the manner I will now proceed to describe, reference being had to the accompanying drawing, in which—

Figure 1 is a vertical section of the smoke-box end of a locomotive-boiler; Fig. 2, a transverse section on the line 1 2; and Fig. 3, an enlarged view, illustrating the construction of the disintegrating-screen.

A represents the smoke-box of a locomotive; B, the front tube-sheet; D, the exhaust-pipe, and E the chimney. A screen, H, of wire-gauze or perforated plates, surrounds the upper portion of the exhaust-pipe, and extends downward from the edge of the chimney-opening in the shell of the smoke-box to the dotted line *x*, or thereabout, where it fits snugly, and is secured to the exhaust-pipe, adjacent to which are vertical tubes I, (two in the present instance,) each tube having a lower termination, *i*, of the flaring shape shown, and the upper portion of each tube passing through the screen H into the chimney E. Directly beneath each of these tubes I is a nozzle, *m*, the several nozzles communicating with a cock or valve, which is under the control of the attendant engineer, and which communicates with the steam-space of the boiler, so that a jet of live steam may be permitted to escape into each tube whenever the accumulation of disintegrated sparks in the smoke-box may demand their expulsion therefrom through the said tubes I into the chimney.

The disintegrating-screen consists of rigid inclined bar G, (two in the present instance,) combined with two sets of horizontal rods, *h h'*. Each bar G is connected at the top to the shell of the boiler, above the highest row of tubes, and is secured at the lower end to the bottom of the smoke-box, and each bar has, in its opposite edges, a series of notches, one for receiving the set of rods *h*, and the other for receiving a set of like rods, *h'*, the two sets of rods being fastened in their notches by strips *y*, secured to the edges of the bars G by screws or otherwise.

The notches in the said bars G are so arranged that each rod *h'* of one set shall be opposite a space between two rods, *h h*, of the other set; hence the sparks, on being forcibly expelled from the tubes, must strike the rods of one or the other sets, and must fall into the bottom of the smoke-box in a disintegrated condition, whence they may be forced from time to time into the flaring lower ends of the tubes I, and through the latter into the chimney by the action of the above-mentioned jets of live steam.

Some of the sparks will be projected against the screen H, and will either pass through the same in a disintegrated condition into the chimney, or will fall to the bottom of the smoke-box, whence they will be expelled through the pipes I.

I claim as my invention—

1. A spark-disintegrating screen in which notched bars G G are combined with two sets of rods, substantially in the manner described.

2. In a locomotive smoke-box, the tubes I, having flaring lower ends, and communicating above with the chimney, in combination with nozzles *m*, from which jets of live steam may be projected into said tubes, all as set forth.

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

ALEXR. MITCHELL.

Witnesses:

HUBERT HOWSON,

HARRY SMITH.