(No Model.)

E. DUNN & R. H. HAVENER.

Spark-Arrester.

No. 227,420. **Patented May 11, 1880.**

Fig. 1.

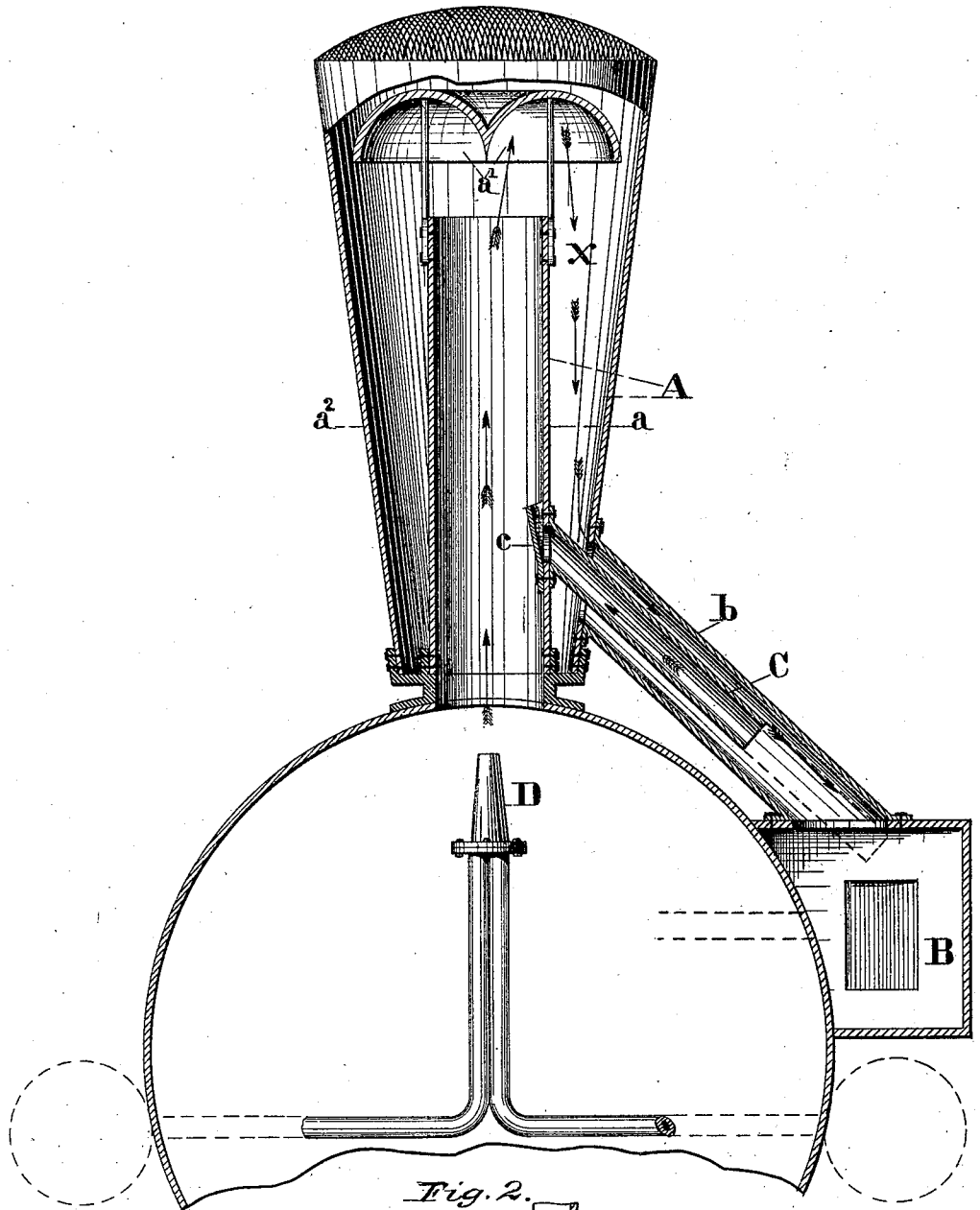
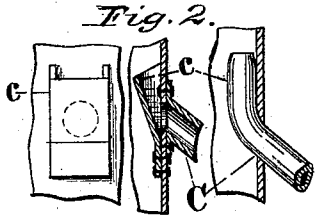


Fig. 2.



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EDWARD DUNN AND RICHARD H. HAVENER, OF ALEXANDRIA, VIRGINIA.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 227,420, dated May 11, 1880.

Application filed April 10, 1880. (No model.)

To all whom it may concern:

Be it known that we, EDWARD DUNN and RICHARD H. HAVENER, of the city and county of Alexandria, in the State of Virginia, have invented a new and Improved Spark-Arrester; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

This invention consists mainly in the combination, with a closed box properly connected to the stack, of certain means for creating a vacuum in the box, as will be fully described hereinafter.

In the drawings, Figure 1 is a central transverse vertical sectional elevation of the smoke-stack; and Fig. 2, detail views of the deflecting-plate *c* and its equivalent, an upwardly-extending pipe.

To enable others skilled in the art to make and use our improved spark-arrester, we will proceed to describe fully the construction of the same and the manner of its operation.

A, Fig. 1, represents a smoke-stack, constructed generally in any proper manner, but essentially provided with a central delivery-pipe, *a*, having the deflector *a'*, and the usual funnel-shaped jacket a^2, inclosing the same.

B represents any suitable box or receptacle, located at any proper point upon the locomotive, which is connected, by means of a pipe, *b*, with the chamber *x*, between the pipe *a* and jacket a^2.

C, Figs. 1 and 2, represents a pipe opening at one end into the interior of pipe *a* and at the other into the pipe *b*, as shown, or into the box B, if desired, as indicated in dotted lines.

c represents a deflecting-plate, located at the lower side of the pipe C, for the purpose of preventing the entrance into the pipe of the ascending gases and products of combustion.

If desired, the pipe C itself may be extended into the pipe *a*, as shown in Fig. 2.

D, Fig. 1, represents the exhaust-nozzles, of the usual constructions.

The operation is substantially as follows: The nozzles D exhaust into the pipe *a* in the usual manner. By the action of the exhaust the air in box B is caused to move up through the pipe *c* in the direction of the arrows and out of pipe *a*. A partial vacuum thus being formed in the box B, air from the upper part of the stack is necessarily drawn into the same through the chamber *x* and pipe *b*. A constant circulation thus being effected through the box, the sparks are led into the same and there deposited.

The box is provided, of course, with a proper opening, by means of which it may be emptied when desired.

The construction of the parts is very simple, and yet very effective results are obtained by their employment.

If desired, a vacuum may be formed in the box by means of a pipe leading directly in the smoke-box, as indicated in dotted lines, in which case the pipe C will be dispensed with.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination of the following elements: a closed box properly connected to the stack, and means, substantially as described, for creating a vacuum in the box, as and for the purpose specified.

2. In combination with the stack having the pipe *a* and jacket a^2, the box B, having the pipe *b* and the pipe C, substantially as described.

This specification signed and witnessed this 9th day of April, 1880.

EDWARD DUNN.
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Witnesses:
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