D. HAWKSWORTH.

Spark-Arrester for Locomotives.

No. 221,553. Patented Nov. 11, 1879.

Fig. 1.

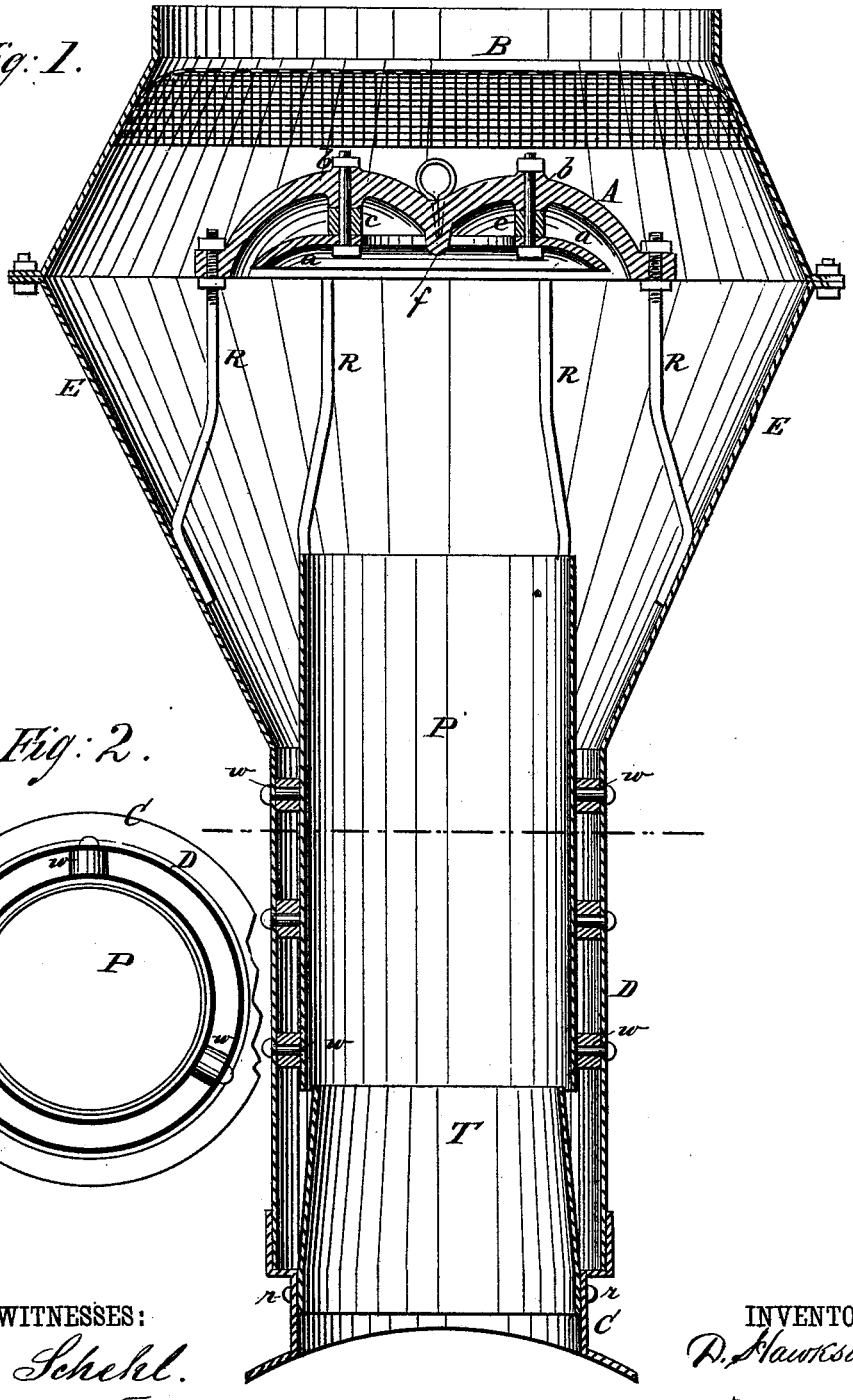

Fig. 2.

WITNESSES:

A. Schehl.

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INVENTOR:

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BY

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DAVID HAWKSWORTH, OF PLATTSMOUTH, NEBRASKA.

IMPROVEMENT IN SPARK-ARRESTERS FOR LOCOMOTIVES.

Specification forming part of Letters Patent No. **221,553**, dated November 11, 1879; application filed August 23, 1879.

To all whom it may concern:

Be it known that I, DAVID HAWKSWORTH, of Plattsmouth, in the county of Cass and State of Nebraska, have invented a new and Improved Spark-Arrester for Locomotives, of which the following is a specification.

The object of my invention is to prevent sparks and cinders from being thrown out of locomotive smoke-stacks, and to accomplish this result without interfering with the draft of the fire.

My invention consists in a cup-shaped spark-arrester that deflects the sparks against the sides of the stack. This is combined with a stack having an annular chamber that receives the sparks, from which chamber they are drawn by suction obtained by the use of an interior conical pipe or nozzle, the sparks and cinders being thus circulated and broken up until they pass off in dust. These features will be more particularly explained with reference to the accompanying drawings, wherein—

Figure 1 is a vertical section of a locomotive smoke-stack embodying my invention. Fig. 2 is a sectional plan view on line *x x*.

Similar letters of reference indicate corresponding parts.

The stack consists of the base C, straight pipe D, and flaring top E, in which is fitted the screen or netting B. In the bottom of the stack, attached by rivets or bolts *r*, is the conical or tapering pipe or nozzle T, the smaller end of which is upward and terminates at the lower end of the straight pipe P. The pipe P is attached within D, and is held concentric by the thimbles and bolts *w*, so that there is an annular space between D and P, and the pipe P extends a short distance within the flaring top E of the stack. The space between the lower end of P and the upper end of the tapering nozzle T is sufficiently large to allow cinders to pass.

The spark-arrester is fitted in the flaring top of the stack above the pipe P. This consists of an inverted cup or dish, A, held in place by the bolts R, that are attached to the sides of the flaring top E, and having attached within it the curved annulus *a*, which is held in place by the bolts *b* and thimbles *c*. The cup A is formed with a nipple, *f*, in the center of its under side, which is above the center of pipe D, and the under side of A curves from the point of *f* outward. The outer edge of the annulus *a* curves downward, and its opening is concentric with the thimble *f*.

In operation, the cinders and sparks thrown upward through pipe P by the locomotive-exhaust strike the spark-arrester in the top of stack, and are either deflected directly against the sides E of the stack or are caught by the annulus *a*. In either case the cinders fall through the space between D and P until they reach the opening at the bottom of P, where, by the suction of the exhaust through the nozzle T, the cinders, &c., are drawn upward through pipe P and thrown again in contact with the arrester. The cinders and sparks are thus kept in continuous circulation until they are broken up so fine that there is not substance enough to hold fire, and they pass off through the netting in the form of dust.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with a stack, B C D E, and arrester A, of the straight tube P and tapering nozzle T, arranged as shown and described.

2. In combination with a locomotive smoke-stack, the spark-arrester consisting of the inverted cup or cone A and curved annulus *a*, supported by the bolts R, substantially as and for the purposes set forth.

DAVID HAWKSWORTH.

Witnesses:
SERENO DUTTON,
ALEXANDER SCHLEGEL.