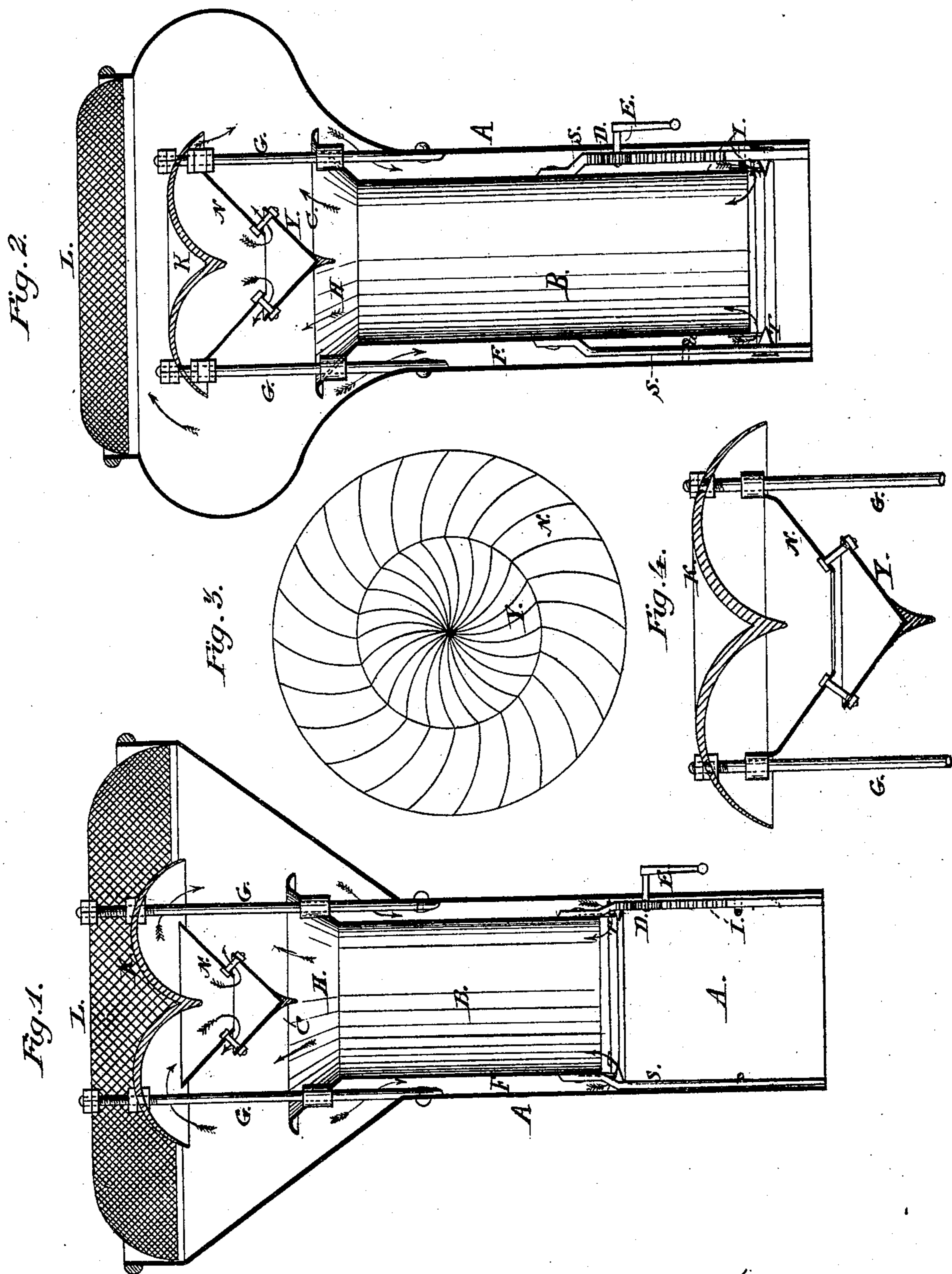


D. ALLARD.  
SPARK-ARRESTER.

No. 171,594.

Patented Dec. 28, 1875.



Witnesses:  
H. J. Stevens.  
H. B. Lewis.

Inventor:  
Derrick Allard

# UNITED STATES PATENT OFFICE.

DERRICK ALLARD, OF ST. ALBANS, VERMONT.

## IMPROVEMENT IN SPARK-ARRESTERS.

Specification forming part of Letters Patent No. **171,594**, dated December 28, 1875; application filed March 8, 1875.

*To all whom it may concern:*

Be it known that I, DERRICK ALLARD, of St. Albans, in the county of Franklin, State of Vermont, have invented a new and Improved Smoke-Stack; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming a part of this specification.

The invention relates to an improvement in the class of smoke-stacks for locomotives in which a vertically-adjustable tube is employed to regulate the draft.

The invention is an improvement upon the smoke-stack described in Letters Patent No. 39,727; and consists in the construction and arrangement hereinafter described and claimed.

Figures 1 and 2 are side elevations, showing the adjustable draft-regulating tube in different positions. Fig. 3 is a bottom-plan view; and Fig. 4, a vertical section of the spark-arrester and the conical deflector, detached.

The lower portion of the casing or outer tube A of the smoke-stack is constructed with parallel sides, and provided with the usual form of wire hood L. The inner tube B has also parallel sides, and is of such size that a considerable space is left between it and the casing A. It is provided with a flange, C, on its upper end, which is turned downward, and a double-beveled or V-shaped ring, T, is attached to its lower end. Said tube is adjusted vertically by means of a rack, I, pinion D, and crank E, and is guided in its vertical movement by rods G G and S S, the latter working in keepers a a, which are attached to the inner side of casing A.

It results from this construction and arrangement of parts that the cinders and sparks carried up by the blast pass entirely through the inner tube B, being prevented from entering the space between it and the casing A by the beveled ring T, and first strike the two-part cone N y, whereby they are diverted outward against the under side of arrester K, and are by it turned in both directions, outward

and downward and inward and downward, as represented by the arrows in Figs. 1, 2. The inward current is again deflected upward by the cap y of the cone, and escapes between it and the base portion N. The outward current is carried down between the inner tube B and casing A, and diverted by the beveled ring into the main current, by which the now broken cinders are again carried upward against the cone N y. This operation goes on until the cinders become so reduced as to enable them to escape with the blast through the hood L.

It will be seen that the beveled ring performs an important function, in connection with the adjustable tube, in that it controls the disposition or direction of the cinders, both in their upward movement and descent, and prevents the blast entering the annular space between the tubes, whatever may be the adjustment of the tube A. This feature, in conjunction with the relative form and arrangement of said tubes, enables a supplementary tube, such as shown in Patent No. 39,727, to be dispensed with.

The concave spark-arrester K and conical deflector N y are attached to and supported by stationary uprights G G.

The tube B may be adjusted upward to meet, or nearly meet, the lower edge of the arrester K, and thus close, or nearly close, the usual exit for exhaust steam and products of combustion. In such case the latter will find exit through the annular space between the tubes. The draft may be thus perfectly controlled.

What I claim is—

The combination, with the casing A and the vertically-adjustable tube B, having parallel sides, and the beveled ring T, attached to the latter, so that it may be adjusted therewith, as shown and described.

DERRICK ALLARD.

In presence of—

H. F. STEVENS,  
H. B. LEWSANT.