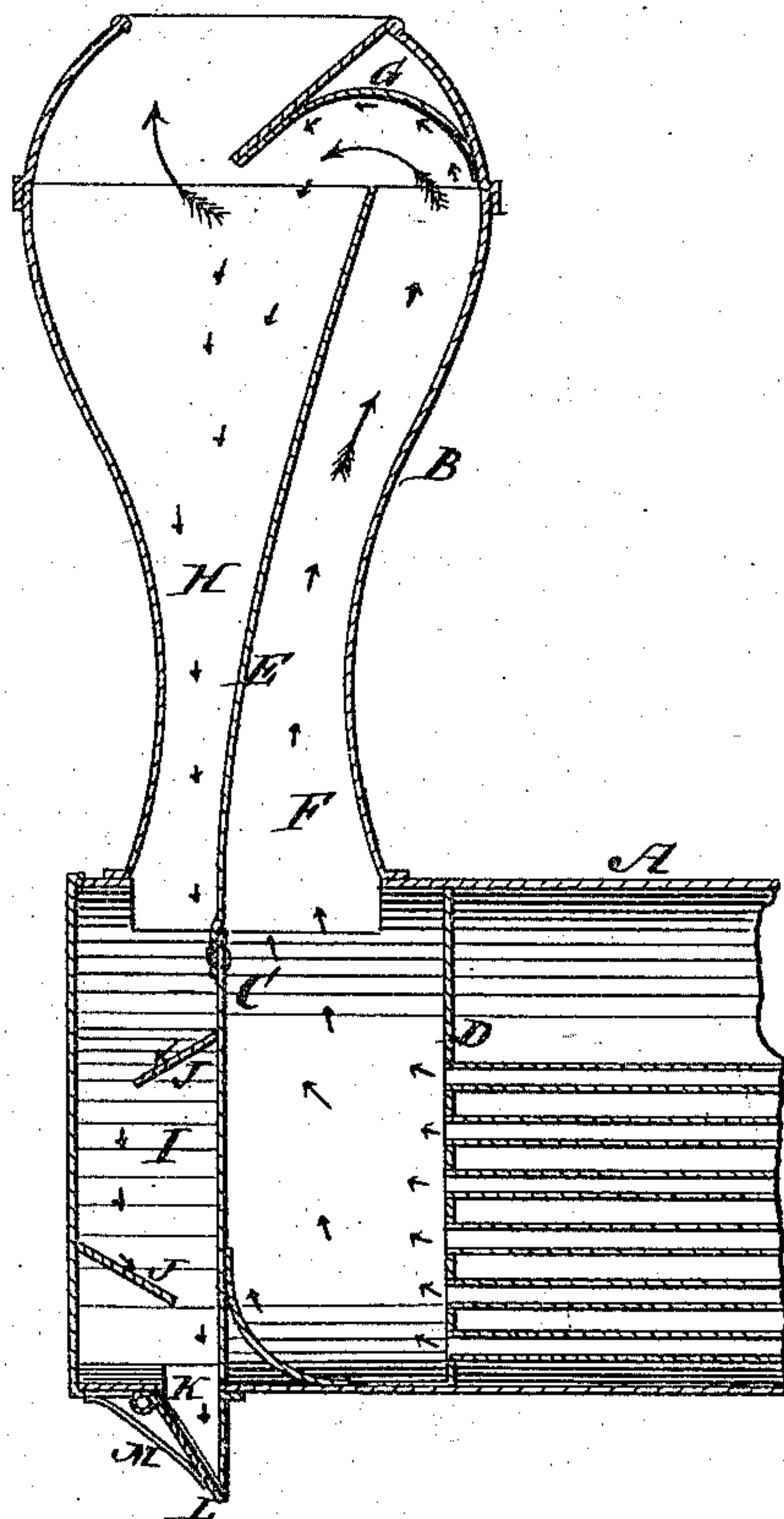
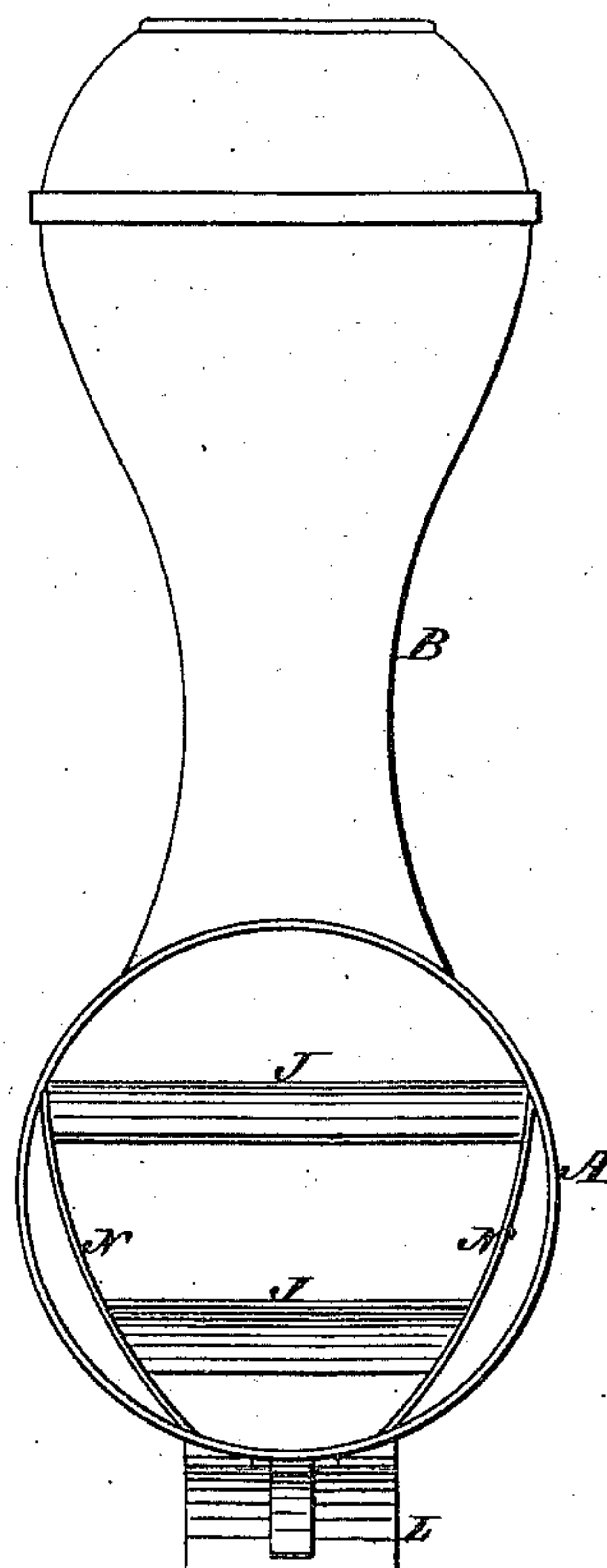


**J. B. WARDWELL.**  
**Spark-Arresters.**

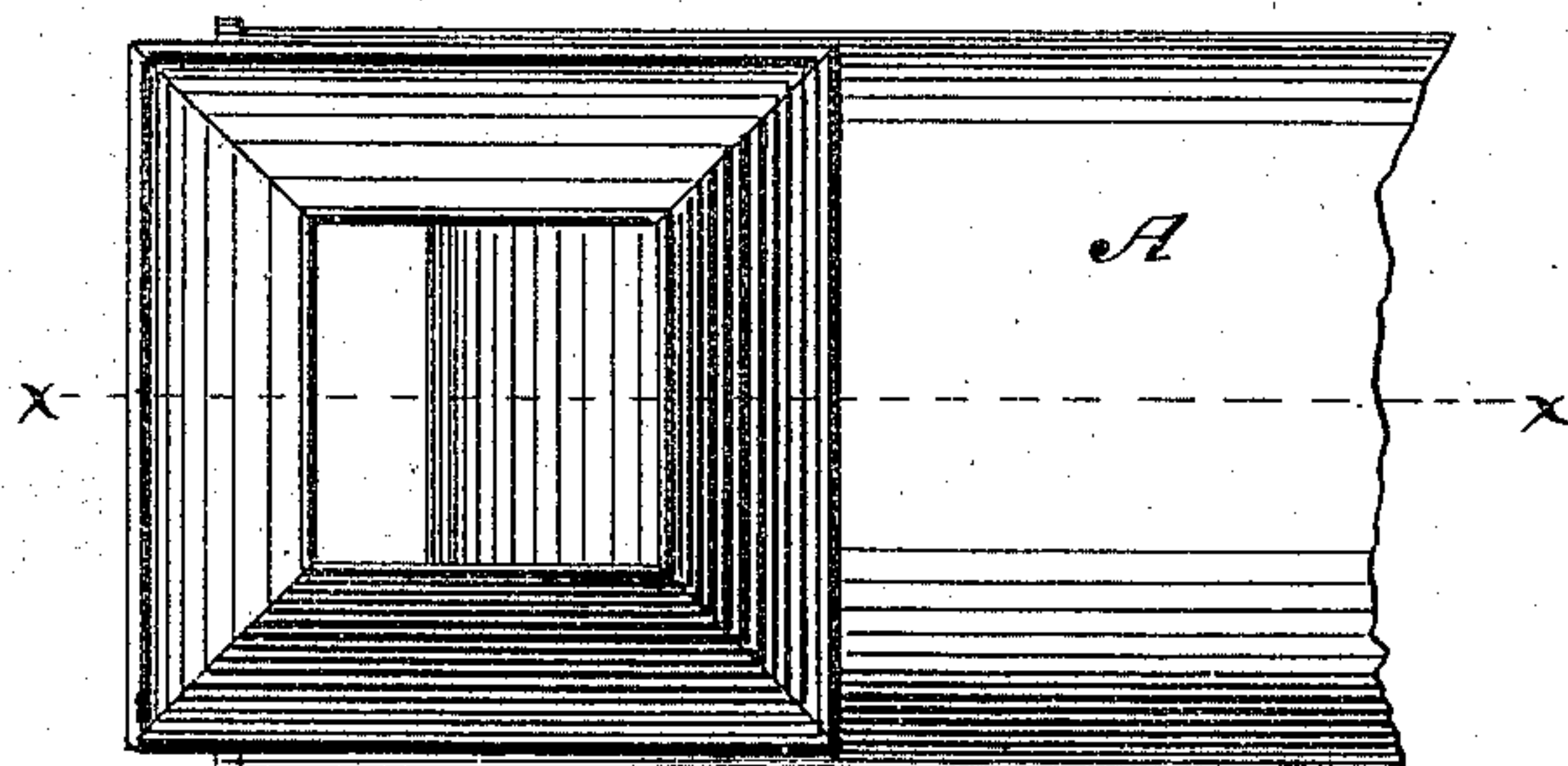
No. 156,469.  
*Fig. 1.*



Patented Nov. 3, 1874.  
*Fig. 2.*



*Fig. 3.*



**Witnesses:**

*E. Wolff.*  
*C. Sedgwick*

**Inventor:**

*J. B. Wardwell*  
**Per** *Wm. L. ...*  
**Attorneys.**

# UNITED STATES PATENT OFFICE.

JEREMY B. WARDWELL, OF LAWRENCE, ASSIGNOR TO HIMSELF AND  
GEORGE E. STANIFORD, OF SALEM, MASSACHUSETTS.

## IMPROVEMENT IN SPARK-ARRESTERS.

Specification forming part of Letters Patent No. **156,469**, dated November 3, 1874; application filed  
January 10, 1874.

*To all whom it may concern:*

Be it known that I, JEREMY B. WARDWELL, of Lawrence, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Spark-Arresters, of which the following is a specification:

The invention will first be fully described, and then pointed out in the claim.

In the accompanying drawing, Figure 1 is a vertical section of Fig. 3, taken on the line *xx*. Fig. 2 is a front-end elevation. Fig. 3 is a top view.

Similar letters of reference indicate corresponding parts.

A represents the boiler. B is the smoke-stack. C is the smoke-box beneath the smoke-stack. D is the tube-sheet of the boiler. E is an upright partition-plate, which extends from below the smoke-box to near the top of the smoke-stack, as seen in the drawing. This plate divides the smoke-box and the smoke-stack into separate compartments. F is the flue into which the steam-exhaust is discharged. G is a curved deflector above the end of the partition E, against which the sparks strike or are driven by the exhaust with more or less violence, and are deflected from their upward course and fall by their own gravity down through the diving-flue or space H of the smoke-stack into the spark-receptacle I. The sparks and cinders are retarded in their descent by the inclined plates J J. This receptacle I is constantly filled with steam from the "exhaust," which, being more or less condensed, extinguishes the sparks before they drop to the bottom of the receptacle. K is the port, through which they are discharged onto the track. This port is provided with a drop-door, L, which is placed in an inclined position and

held up by a spring, M, which readily yields when the door is pressed downward by the weight of sparks and cinders which may have accumulated in the receptacle. N N are plates on opposite sides of the spark-receptacle, to which the ends of the retarding-plates are attached, and which prevent the sparks from lodging in the receptacle.

Smoke-stacks of locomotives are ordinarily made cylindrical or round in cross-section, which is perhaps the easiest and least expensive mode; but in the present case, by a square or rectangular form, the different parts and space can be much better adapted to the purposes for which they are intended than by a circular cross-section. The expansion and contraction of the square stack leaves the area of the flues in the required proportion to produce the desired effect. The construction of the smoke-stack, therefore, is deemed an important feature. The course of the sparks from the time they leave the tubes of the boiler till they are discharged through the port is indicated by arrows.

By the mode described a spark-arrester is produced without screens and without retarding the draft of the boiler.

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

The combination, with spark-receptacle I, of the plates J J and N N, all constructed and arranged substantially as and for the purpose set forth.

JEREMY B. WARDWELL.

Witnesses:

A. J. WALKER,  
F. ST. C. HERRICK.