

J. W. NESMITH.

Smoke-Stacks and Spark-Arresters.

No. 154,412.

Patented Aug. 25, 1874.

Fig. 1.

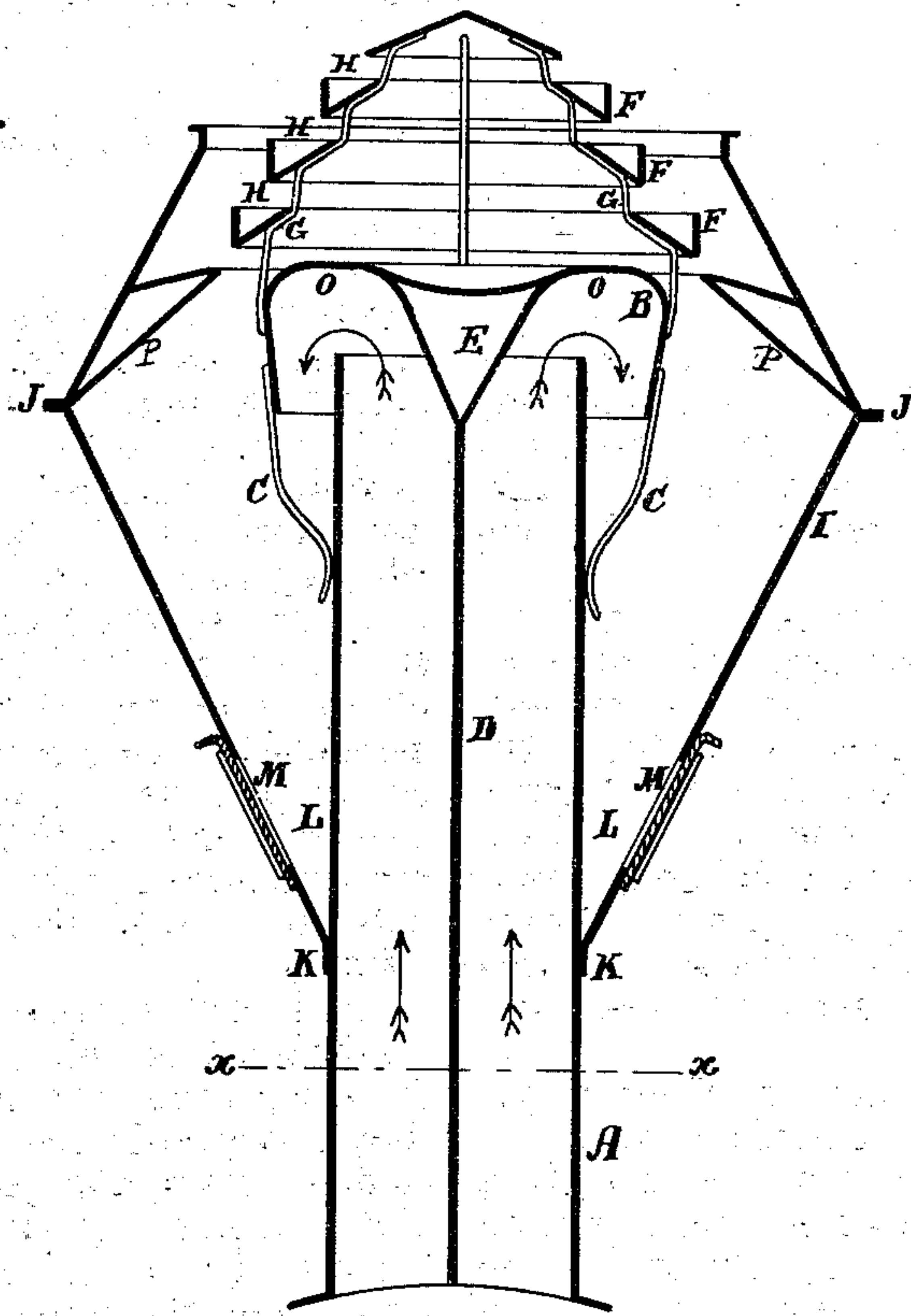


Fig. 3.

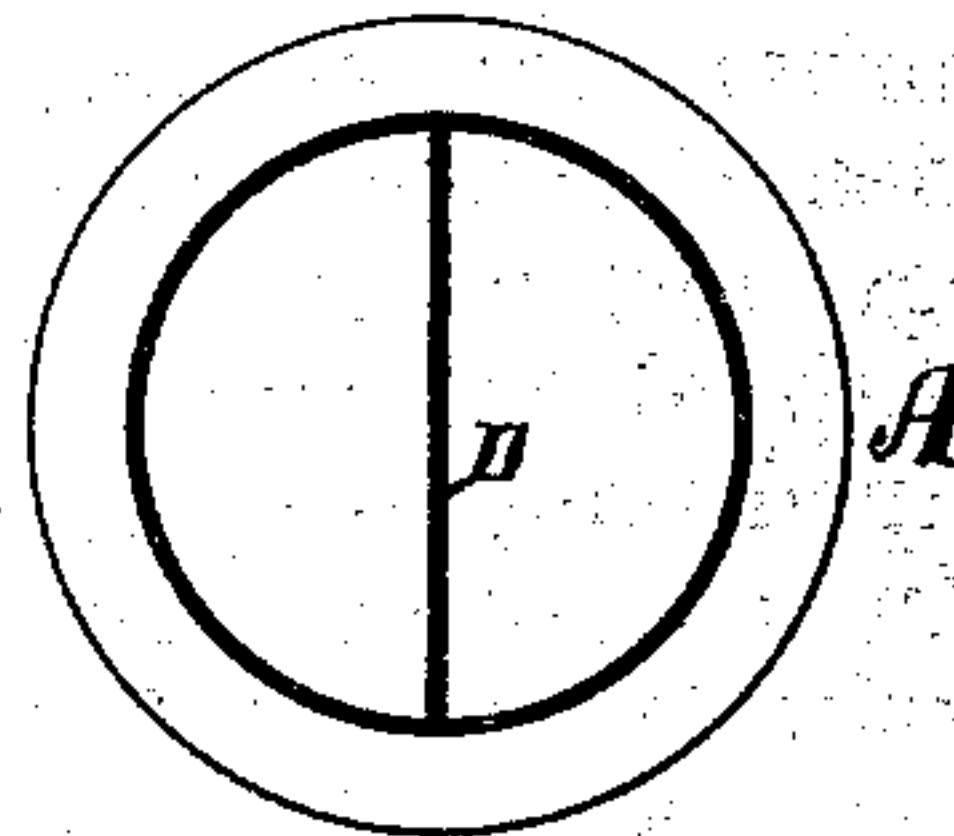
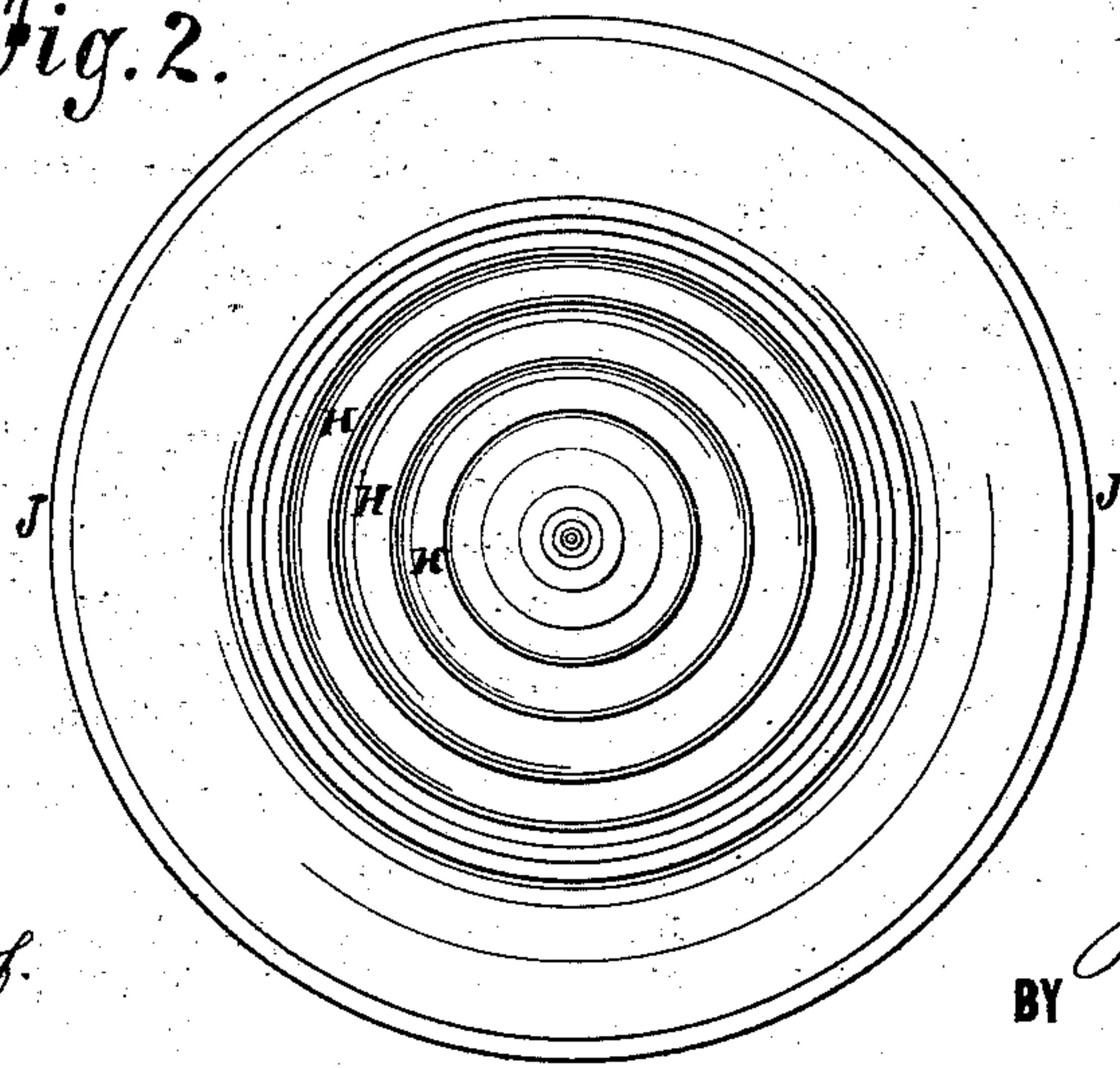


Fig. 2.



WITNESSES:

A. Benneken  
Sedgwick

INVENTOR:

BY

ATTORNEYS.



# UNITED STATES PATENT OFFICE

J. WELLINGTON NESMITH, OF GOLDEN, COLORADO TERRITORY.

## IMPROVEMENT IN SMOKE-STACKS AND SPARK-ARRESTERS.

Specification forming part of Letters Patent No. **154,412**, dated August 25, 1874; application filed May 1, 1874.

*To all whom it may concern:*

Be it known that I, J. WELLINGTON NESMITH, of Golden, in the county of Jefferson and Territory of Colorado, have invented a new and useful Improvement in Smoke-Stacks and Spark-Arresters, of which the following is a specification:

The object of this invention is to furnish a smoke-stack and spark-arrester for coal-burning locomotives which will not only prevent the escape of sparks, but economize fuel. Ordinary smoke-stacks (when the coal which is used on western roads is being burned) throw a stream of sparks, which endangers everything combustible which is exposed. By the present improvement the sparks are arrested and drop by their own gravity into a receptacle provided for them.

The invention consists of an inverted pot over the top of the flue, confined in any substantial manner, having attached thereto a series of concentric flanges or rings, forming (together) an open pyramid, surmounted by a cap, all in combination with the diamond-shaped bulge or head of the smoke-stack.

In the accompanying drawing, Figure 1 is a vertical central section of the improved smoke-stack. Fig. 2 is a top view. Fig. 3 is a cross-section of Fig. 1 on the line *x x*.

Similar letters of reference indicate corresponding parts.

A is the smoke-flue. B is the inverted pot, supported over the top of the flue by the vertical springs C, or by any other suitable means. The flue is divided into two parts by the vertical partition D, which meets the apex of the inverted cone E within the pot B. F represents one or more flanges above the pot, and attached thereto by the straps G. These flanges diminish in diameter from the lower to the upper one, as seen in the drawing, with space H between for the discharge of the smoke. I is the head of the smoke-stack, consisting of the frustums of two cones, connected at their bases J. This head is attached to the outside of the smoke-flue at K, forming (with the flue) a V-shaped annular space, L, for

receiving the sparks. *m m* are apertures in the head near the connection K, closed by the slide N, through which the sparks are removed. The course of the sparks and products of combustion is indicated by the arrows. As they ascend they are driven upward by the blast till they strike the curved surface O of the pot. The sparks, being thus arrested, drop by their own gravity into the V-shaped receptacle L, from whence they are removed. The smoke and gases pass out and upward, and escape without carrying any fire. The partition D is not an indispensable feature, and the smoke-stack may be made either with or without it, to produce the same or a similar effect.

It will be seen that the entire products of combustion, as well as the exhaust-steam, are discharged into the inverted pot, and from that downward; the sparks falling, and the smoke, steam, and gases rising, as described. With this smoke-stack and spark-arrester, combined and arranged as shown, fuel is economized and the "spark nuisance" is entirely abated.

By dividing the smoke pipe or flue A and the cap B correspondingly into two or more parts, the products of combustion are separated and driven out in separate currents, being thus able more readily to lose their heat and deposit their sparks in the troughs F H, to which they are guided by the inner flange or cone P.

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

The combination, with flue A, cap B, and stack-head I, of the guiding-cone P and the series of troughs F H, growing gradually smaller as they arise above the cap, and having open intervals between them, as and for the purpose specified.

J. WELLINGTON NESMITH.

Witnesses:

JAS. M. MANAHAN,  
W. C. ARMOR.