

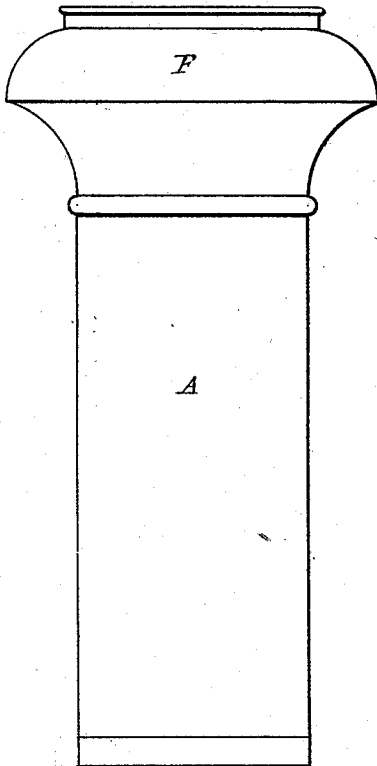
W. W. PIPER.

SPARK ARRESTERS FOR LOCOMOTIVES.

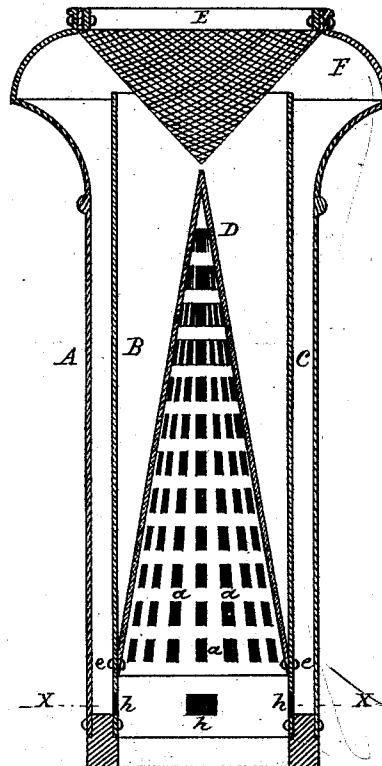
No. 171,951.

Patented Jan. 11, 1876.

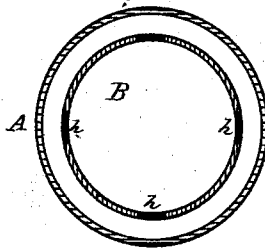
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



Witnesses.

Jonathan Ord.  
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# UNITED STATES PATENT OFFICE.

WILLIAM W. PIPER, OF PITTSBURG, PENNSYLVANIA.

## IMPROVEMENT IN SPARK-ARRESTERS FOR LOCOMOTIVES.

Specification forming part of Letters Patent No. **171,951**, dated January 11, 1876; application filed October 13, 1875.

### *To all whom it may concern:*

Be it known that I, WILLIAM W. PIPER, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Smoke-Stacks Designed for Use on Locomotives.

My invention will be readily understood from the following description, taken in connection with the accompanying drawing, wherein—

Figure 1 represents an outside view or elevation of my improved smoke-stack; Fig. 2, a vertical and central section of the same; Fig. 3, a transverse section of the lower part of the stack, taken on the line *x x*.

Externally this smoke-stack may be constructed in any of the well-known forms, but in order to grind, break up, and disintegrate the large cinders, sparks, or bits of coal, prior to their exit from the stack, I construct the cylindrical part or portion of the stack of two unequal-sized barrels, A B, the one placed within the other, and so arranged as to leave a space, *c*, between the two. Perpendicularly within the smaller cylinder B is a long cone, D, of perforated sheet metal, its base united, by means of rivets *e*, to and near the bottom of said cylinder. Above, and in a reverse position, or so that its apex will rest upon that of the lower cone, is placed another cone, E, constructed wholly of wire-gauze netting, its base terminating in the upper inside edge of the dome F on top of the stack, and is secured in that position by means of short bolts, transverse rivets, or by any other means found in practice most convenient. This construction of smoke-stack is such that any cinders, large sparks, or bits of coal will in their flight from the flues of the boiler first pass into the long upright cone D, and through

the numerous long narrow slits or openings *a a* made therein, and from thence through the meshes of the upper wire-gauze cone E, and out at the top of the stack; but in the event of very large sparks or bits of coal, and such as are liable to carry fire, that have passed easily through the openings *a* of the lower cone D, their outward flight will be arrested by the fineness of the wire-gauze netting or upper cone E, when they will fall back into the annular space *c* between the cylinders A B; passing through appropriate holes *h h* around and near the bottom of the stack, will again enter the lower upright cone, and thus, by the upward draft and escaping steam, be forced once more through its narrow slits or openings, which operation will be repeated until they are reduced to that condition as will enable them, divested of their fire, to readily and easily pass through the meshes of the wire-gauze cone, and from thence be carried away with the smoke by the action of the atmosphere, the whole contrivance operating in the manner of a straight-shoot chimney.

I claim—

1. The upright perforated cone D and inverted wire-gauze cone E, in combination with the barrel of a locomotive smoke-stack.
2. The upright perforated cone D and inverted wire-gauze cone E, in combination with the inside cylinder B, as and for the purposes set forth.
3. The annular space C and holes *h* near its bottom, in combination with the upright perforated cone D, as and for the purposes set forth.

WM. W. PIPER.

Witnesses:

JOSIAH W. ELLS,  
ROBERT S. SILL.