

G. STEWART.
Spark-Arrester.

No. 223,403.

Patented Jan. 6, 1880.

Fig. 1.

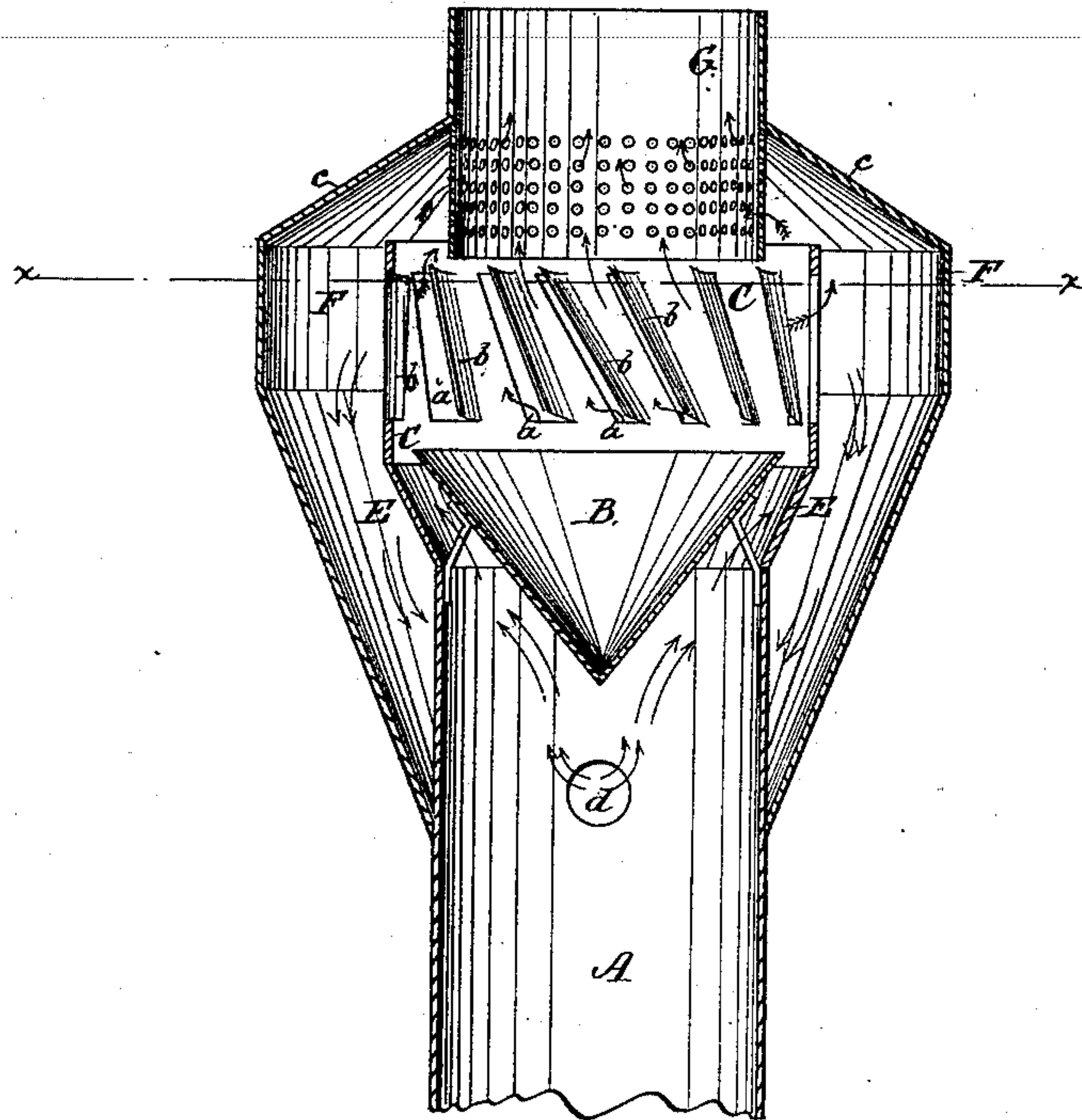
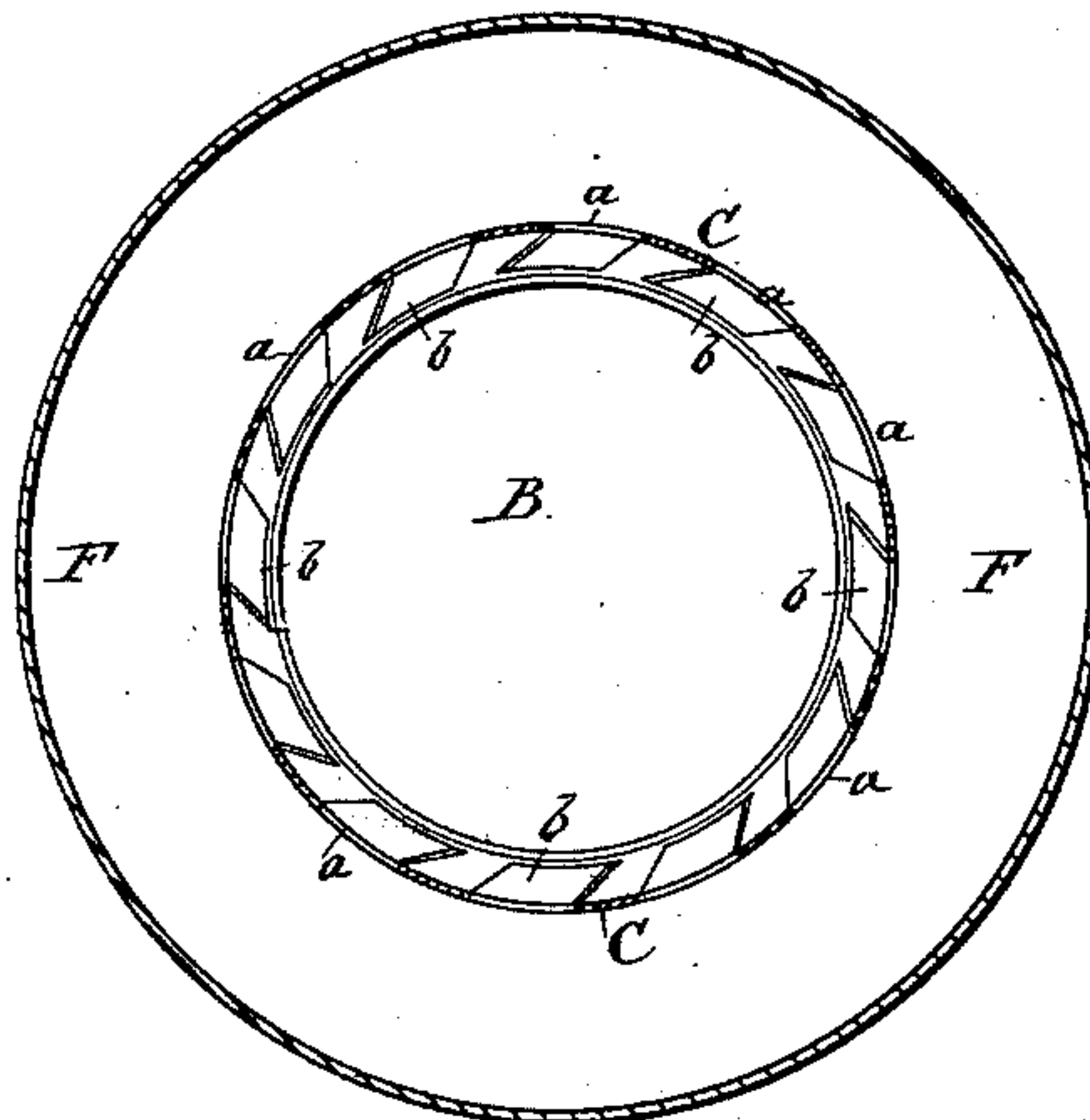


Fig. 2.



WITNESSES:

W. W. Hollingsworth
Amos W. Hart

INVENTOR:

Geo. Stewart
BY *Wm. Le*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

GEORGE STEWART, OF HIGH POINT, NORTH CAROLINA.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 223,403, dated January 6, 1880.

Application filed August 27, 1879.

To all whom it may concern :

Be it known that I, GEORGE STEWART, of High Point, in the county of Guilford and State of North Carolina, have invented a new and Improved Spark-Arrester; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention is an improvement in the class of smoke-stacks in which the ascending sparks and cinders are diverted laterally by an inverted cone and strike upon inclined flanges or wings, whereby they are extinguished and pulverized before escaping from the stack.

In my invention the inclined flanges or wings project inward from the slotted ring of which they form a part, and the sparks and cinders which are not finely pulverized at the first contact with the wings fall downward and pass through holes in the lower part of the stack, thus mingling again with the ascending current of live sparks, and again striking upon the cone and wings, and so on, in continuous round or succession, until reduced to powder and carried off into the atmosphere in the form of dust or fine powder.

My improved spark-arrester is intended more particularly for use on portable steam-engines.

In accompanying drawings, forming part of this specification, Figure 1 is a vertical central section of my improved smoke-stack or spark-arrester, and Fig. 2 a cross-section on line *xx* of Fig. 1.

The cylindrical portion A of the smoke-stack is designed, in practice, to be bolted to the collar or flange of a smoke-box. (Not shown.) The inverted cone B is placed partly within and supported upon the upper end of said part A; and immediately above the cone A is the annulus C, having parallel diagonal slots or openings *a* in its vertical sides and a like number of wings, *b*, which are located beside the slots *a* and inclined lengthwise diagonally to the vertical axis of the stack, as shown in Fig. 1. The said wings are also inclined transversely or set inclined inward at an angle of about forty-five degrees to tangents of the periphery of the ring C, as shown in Fig. 2. The upper edge of the cone B terminates at

or below the lower edge of the wings *b*, and the ring C is supported by an imperforate frustum of a hollow inverted cone, E, which is suitably attached to the head of the cylindrical pipe A.

All the parts above described, save the lower portion of pipe or stack A, are inclosed by the double conical head F of the stack.

A perforated tube, G, is pendent from the detachable cap *c* of such head F, its lower edge projecting down into or just meeting the upper edge of the slotted ring C.

As the smoke and steam ascend in pipe A they are, in part, diverted by the cone through the slots *a* of the ring C, while a portion ascends directly through the perforated tube G. The sparks and live cinders carried up in the blast strike upon the outer sides of the inclined wings *b*, and are thus mostly extinguished and partly pulverized and forced laterally into the space surrounding the ring C, where they fall by gravity and pass back into the pipe A through holes *d* at the bottom of the double head F, and are thus again carried up by the blast and projected successively against the cone B and wings *b*, as before; and so the operation goes on until the sparks, cinders, &c., have become reduced to a pulverulent condition, and thereby adapted to escape by passing upward directly through the center of the pendent tube G or through the perforations in its sides. The courses of the steam and pulverulent portion of the sparks and cinders are respectively indicated by single and double arrows, Fig. 1.

It will be perceived that by the above-described construction and arrangement of parts the sparks and cinders are diverted laterally at the outset, while a portion of the steam and smoke and lighter particles take the direct unobstructed course upward through tube G. Such portion of the steam, smoke, &c., as does not escape in such direct course passes through the sides of tube G.

The form and arrangement of the wings *b* facilitate such operation.

The wings *b* may be made separate from the body of the annulus C and bolted thereto; but I prefer they shall form integral portions

of the body of the annulus, and I therefore form them by slitting the latter and bending inward the portions thus cut out.

What I claim is—

- 5 In a spark-arrester, the combination, with cylinder A, having lateral opening *d* at or near the bottom, of the inverted cone B, the slotted annulus C, made larger than the cone, and having wings *b* projecting inwardly from its

periphery, the perforated tube G, made of less 10 diameter than said annulus, and the latter being placed between the cone and tube, all constructed and arranged as shown and described, for the purpose specified.

GEORGE STEWART.

Witnesses:

W. H. SNOW,

CHAS. G. MANN.