(Model.)

F. F. LANDIS.

SPARK ARRESTER.

No. 332,260. Patented Dec. 15, 1885.

Fig. 1.

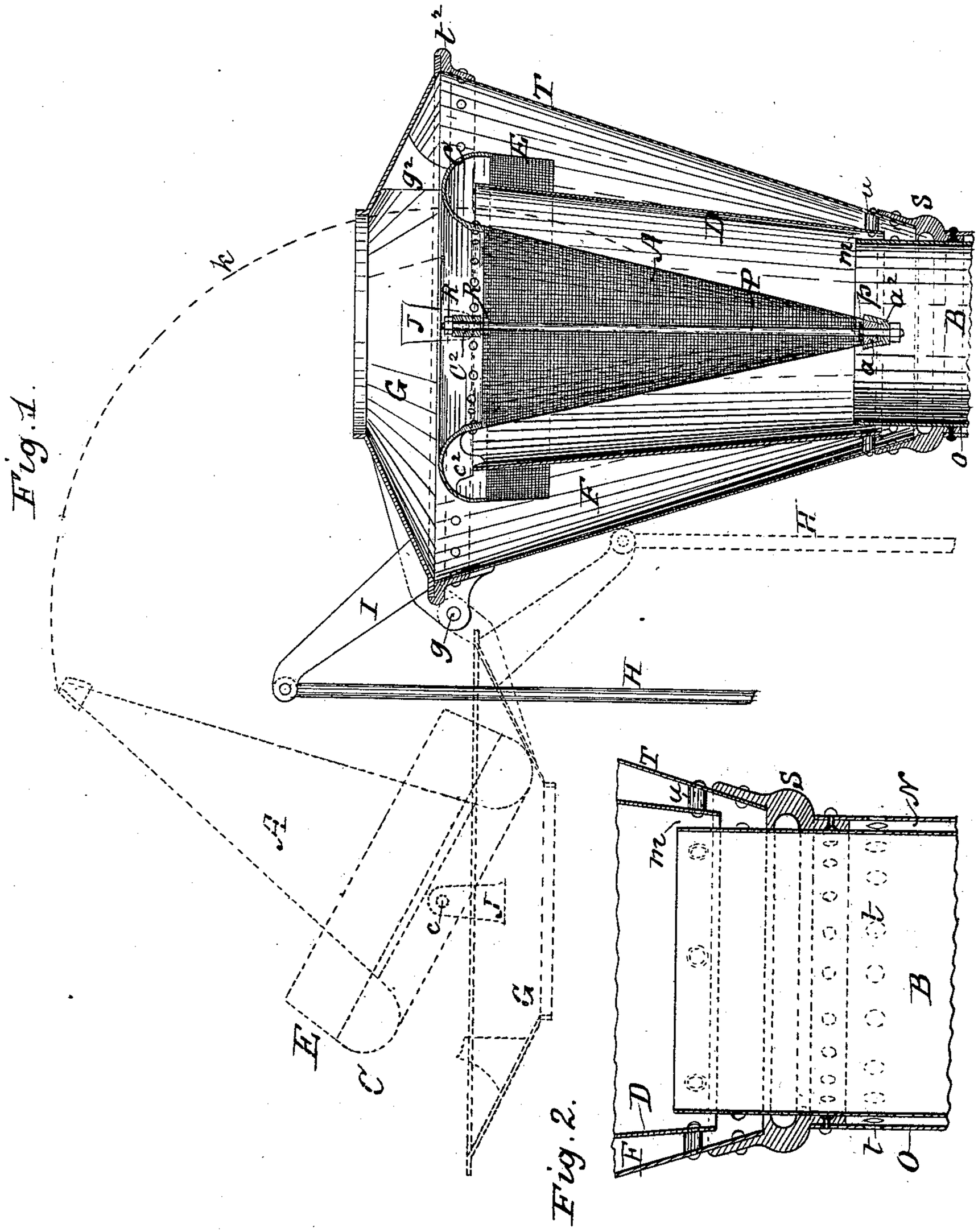

Fig. 2.

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SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 332,260, dated December 15, 1885.

Application filed October 1, 1885. Serial No. 178,702. (Model.)

To all whom it may concern:

Be it known that I, FRANK F. LANDIS, a citizen of the United States, residing at Waynesborough, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Spark-Arresters, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to spark-arresters located in the upper end of the smoke-stacks of locomotives, portable-engine boilers, &c.; and the objects of my improvement are to produce a device to arrest all sparks issuing from a smoke-stack without materially obstructing the current of gases escaping from said stack. I attain these objects by the construction illustrated in accompanying drawings, in which—

Figure 1 represents a vertical central section of the upper end of a smoke-stack having a spark-arrester constructed in accordance with my invention. Fig. 2 is a vertical section upon a large scale of the upper end of the stack and its connections with the conical head thereof.

Similar letters refer to similar parts throughout these views.

Above the upper end of the stack is suspended in an inverted position a cone, A, made of fine netting, the area of which is about three times the area of the stack B. The upper edge of this cone is suspended from the inner edge of a concavo-convex ring, C, having on its outer edge a pendent band, E, of fine netting screwed thereto, and said ring C is suspended from pivots *c*, entering the lower end of hangers J, secured to the under side of the cap G of the stack. To improve the appearance of the chimney and conceal the fire-heated flue B, the latter is inclosed in a shell or jacket, O, having perforations *t* near the top, and also near the bottom, (but the latter are not shown in the drawings,) to permit air to circulate in the space N between the flue B and its jacket, and prevents the latter from getting hot enough to burn paint upon its surface. The upper end of the jacket O carries the large truncated cone T, forming the outer flue of the spark-arrester, and to produce a strong connection between the parts O and T a cast ring, S, of brass or other suitable metal is used, the lower end of which enters the upper end of the jacket O, and is riveted thereto, while the upper end of the ring receives the lower or small end of the truncated cone T and is also riveted thereto. A bead is formed upon the surface of the ring S to improve its appearance. The lower portion of this ring is not riveted to but simply fits around the flue B, so that the latter can be lifted out when it becomes burned or rusted and it is desired to renew it. To the lower portion of the cone T is secured in its interior the lower end of a slightly-conical flue, D, by means of rivets passing through thimbles *u*, that retain the parts D and T concentric, but at a sufficient distance apart for the passage of the largest sparks or unconsumed fuel back under the lower edge of the flue D, and into the interior of said flue, an annular passage, *m*, being also kept between the lower edge of the flue D and the stack B, the upward current of gases in said stack producing a suction in the passage *m*, and in the bottom of the chamber F, formed by the cones D and T. The area of the annular passage between the upper end of the conical flue D and the spark-deflecting concave ring C, or between said flue D and the cone A or the netting-band E, is equal to the area of the stack B, so that even if all the meshes of the parts A and E, should become clogged the only check to the draft would be on account of the slightly-indirect course the smoke would be compelled to take.

To promptly remedy any clogging of the netting, the cap G of the stack is hinged at *g* to lugs projecting laterally from the top of the cone T, or from a band, t^2, encircling said top, and said cap can be turned over, as shown by dotted lines, by the attendant pulling on the hand-rod H, which is pivoted to the outer end of an arm, I, secured upon the top G, and when in this position the netting can be easily brushed off, as the spark-deflecting ring C, and the cone A carried thereby, is pivoted to the cap, the point of said cone will become tilted, and follow the dotted line *k* in or out of the upper end of the flue D. However, it will be rarely necessary to clean the netting if the cap and its appendages are turned off to one side when the fire is first started, as it is then that the netting will become clogged while the

smoke is cold and contains much moisture. After the cone A is returned in position within the flue D, it is kept from oscillating or steadied by means of a lug, c^2, secured within the concavity of the ring C, its shoulder abutting against the edge of the flue D, and also by means of a projection, g^2, hanging from the under side of the cap G, and resting upon the ring C.

The netting at the small end of the cone A is clamped between a small cone, *a*, placed internally, and a hollow cone, a^2, placed externally. A rod, P, passes through both cones *a* and a^2. This rod has a collar, *p*, that rests upon the broad end of the cone *a*, while a nut on the lower end of the rod bears upon the small end of the hollow cone a^2.

To retain the netting under tension, the upper end of the rod P passes through the hub of the transverse bar C^2, and is provided with a nut, R, above and under said hub, so that by slackening the upper nut and running the lower one tightly under said hub the collar *p* on the lower end of the rod P forces the clamping-cones *a* and a^2 down and stiffen the netting.

Having now fully described my invention, I claim—

1. The combination of the stack B, the outer cone, T, the inner cone of netting, and the intermediate flue, D, independent from the flue B, with the deflecting-ring C, located above the edge of the flue D, and the pendent netting-band E of said ring, substantially as and for the purpose described.

2. The combination of the cap G, having hangers J, with the deflecting-ring C, pivoted to the latter, substantially as and for the purpose described.

3. The combination of the cone T, the cap G, hinged to the latter, the deflecting-ring pivotally supported from the cap, and a cone of netting secured to the deflecting-ring, substantially as and for the purpose described.

4. The combination of the deflecting-ring, its cone netting and transverse bar C^2, with the internal cone, *a*, external cone, a^2, and the central rod the whole length of the cone netting, substantially as and for the purpose described.

5. The combination of the flue-jacket O, the conical inner flue, D, the outer cone, T, and connecting-ring S, with the removable stack-flue B, substantially as and for the purpose described.

6. The combination of the stack B, the outer cone, T, and the inner cone of netting having a concavo-convex deflecting-ring secured to its upper edge, with the flue D, having a smoke-passage above its upper edge and a spark-passage under its lower edge, substantially as described.

7. The combination of the conical flue D, the internal cone netting, the deflecting-ring, and steadying-lug c^2, with the cap G, hinged to one side of the outer cone of the smoke-stack, substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK F. LANDIS.

Witnesses:

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