(No Model.)

J. H. READER.

SPARK ARRESTER.

No. 358,986. Patented Mar. 8, 1887.

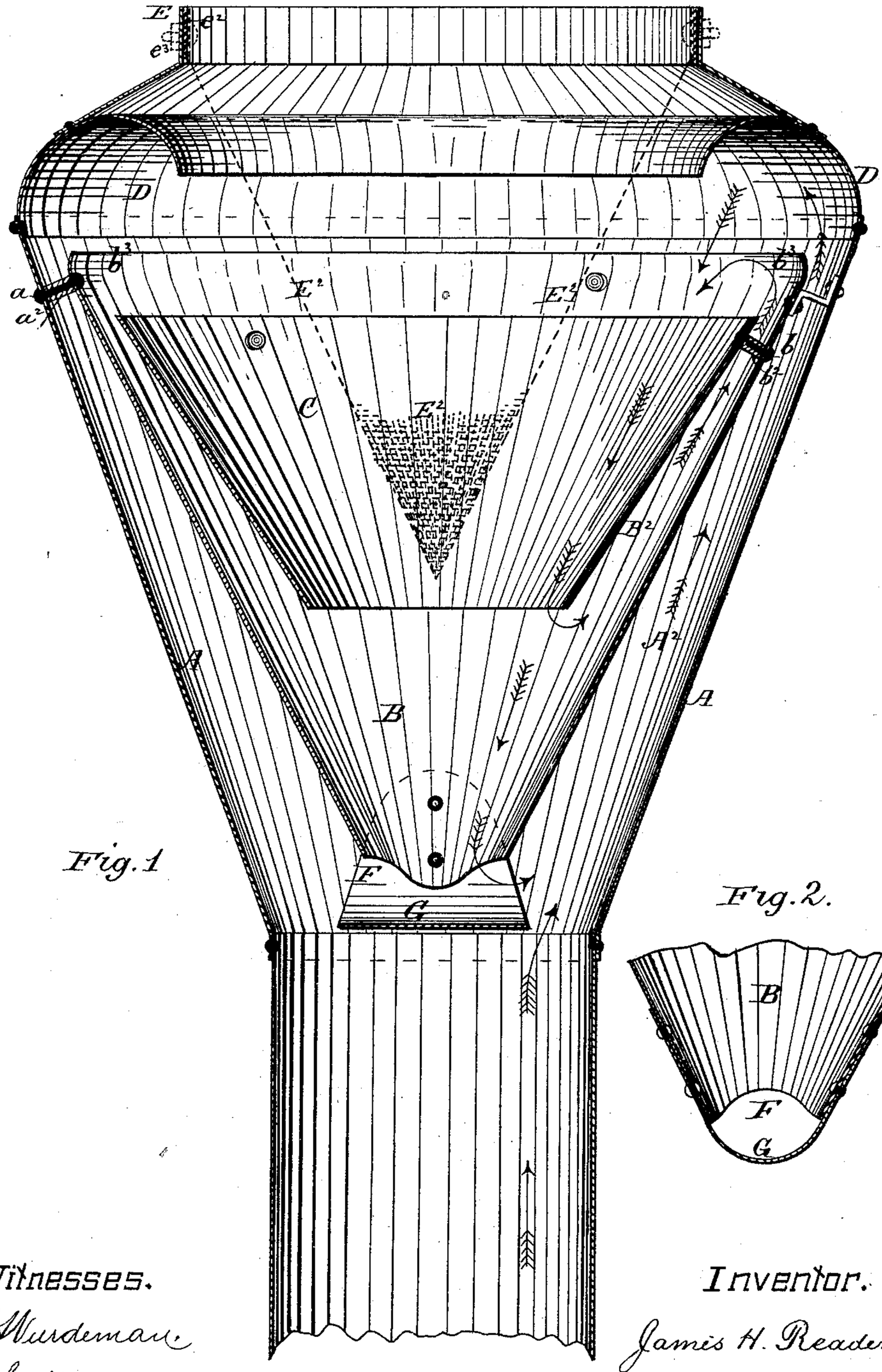

Fig. 1

Fig. 2.

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UNITED STATES PATENT OFFICE.

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SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 358,986, dated March 8, 1887.

Application filed October 2, 1886. Serial No. 215,117. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. READER, a citizen of the United States, residing at Waynesborough, in the county of Franklin, 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 means for arresting sparks as they issue from the furnaces of steam-boilers, disintegrating and pulverizing them by contact with up and down passages within the smoke-stack until they are extinguished and reduced to such degree of fineness as to become harmless so far as danger from fire is concerned.

This invention and its operation will first be described, and then be specifically pointed out in the claims.

In the drawings, Figure 1 is a vertical section of a smoke-stack constructed in accordance with my invention. Fig. 2 is a vertical section of the lower end of one of the internal cones, taken at right angles to the section in Fig. 1.

In said drawings, A represents the conical upper end of the smoke-stack, within which is placed the sheet-metal cone B, of smaller diameter and more acute taper, but of substantially the same length, as the outer conical shell, A. It has its upper end secured to the latter by means of rivets a, passing through thimbles a^2 or through angle-irons, so as to leave a tapering circular passage, A, between them.

Within the cone B, and wholly inclosed thereby, is a truncated sheet-metal cone, C, that is again of smaller diameter and more acute taper than said cone B, and has its upper end secured to the latter by means of rivets b, passing through thimbles b^2, so as to leave a tapering circular passage, B^2, between them. To the upper end of the conical outer shell, A, is secured the concave deflector D, having its inner edge overhanging the upper edge of the inner cone, C, to deflect the sparks into the latter. Upon the top of the deflector D is placed a ring, E, having its lower portion flaring outwardly and secured to said deflector.

As it is sometimes desirable to still further guard against the escape of small sparks when the machine is to be usid among straw-stacks and other inflammable substances, in such cases a wire-netting cone, E^2, having its wide edge secured to a ring, e^2, is placed within the stack with its point downward, and its ring e^2 secured by easily-removable fastenings, as a few bolts, e^3, to the ring E of the stack. The upper edge of the cone B is slightly bent inwardly at b^3 to facilitate the escape of the finely-pulverized specks of coal with the smoke. The lower end of the cone B is cut off, and has pendent therefrom a hood, G, so secured to this cone as to leave passages F between the hood and the lower edge of the cone for the passage of the large sparks out of the cone B back into the taper passage A^2 of the stack. The hood at the same time prevents the exhaust-steam and smoke from passing directly up through the cones B and C.

In operation, the smoke and sparks are carried up between the shell A and the cone B, and, as the passage A^2 is tapering in cross-section from the lower end until it reaches the deflector, the sparks will strike with great force the under side of the deflector, and by their momentum be driven down through the cone or receiving-chamber C and out of the bottom of the cone B into the hood G, and be drawn by the section of the draft through the openings F and into the main stack, and be thrown again against the deflector, and will go through the same operation until they are broken fine enough to loose momentum and be carried up with the smoke through the upper central opening of the stack and into the outer air. A portion of the smoke and exhaust-steam being directed down into the cone C by the deflector D, will produce some pressure in said cone, and consequently an upward current between the cones B and C, into which the small sparks will be forced and caused to circulate until small enough to be carried with the smoke. The arrows on the drawings show the course of the sparks until they are broken up and extinguished.

The advantages obtained by inclosing the cone C wholly within the cone B is to produce a long continuous passage and a current to carry the sparks against the walls of both cones, and by friction therewith pulverize and extin-

guish them; but I am aware that smoke-stacks have been provided with internal hollow cones placed one above the other, and that one of the cones has even been made to enter partly within the other, and I do not claim that construction.

Having now fully described my invention, I claim—

1. A spark-arrester consisting of the outer conical shell, A, having the inwardly-curved deflector D secured to the top thereof and within said shell, the cone B, having an opening in its lower end and a hood in front of said opening, in combination with the truncated cone C, wholly within the middle cone, B, whereby passages are produced, substantially as and for the purpose described.

2. In a spark-arrester, the combination of the outer conical shell, A, having the inwardly-curved deflector D secured to the top thereof and within said shell, the cone B, having its upper edge bent inwardly and an opening in its lower end, with a hood in front of said opening, and a truncated cone, C, wholly within the cone B, substantially as described.

3. The combination of the outer conical shell, A, its inwardly-curved deflector, D, having the ring E secured thereon, the cone B, having its bottom opening protected by a hood, and the truncated cone C, wholly within the cone B, with the cone E^2, consisting of wire-netting secured to the ring E, substantially as described.

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

JAMES H. READER.

Witnesses:

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