W. W. Hubbell,

Spark Arrester,

No. 2,143. Patented June 26, 1841.

Fig: 1

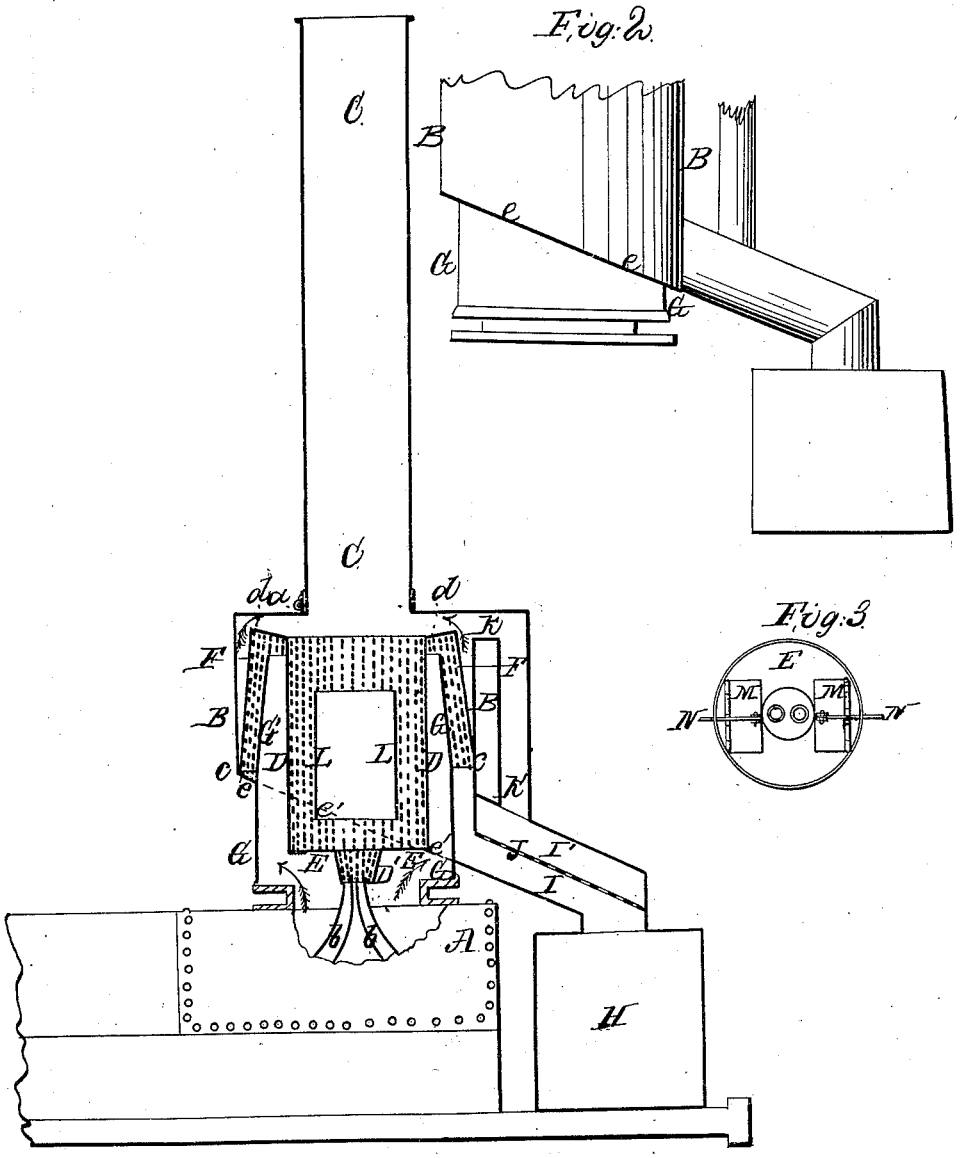

Fig: 2.

Fig: 3.

UNITED STATES PATENT OFFICE.

WM. W. HUBBELL, OF MOYAMENSING, PENNSYLVANIA, ASSIGNOR TO LEONARD PHLEGER.

SPARK RETAINER OR DEPOSITOR FOR PREVENTING THE ESCAPE OF SPARKS AND DUST IN LOCOMOTIVE STEAM-ENGINES, &c.

Specification of Letters Patent No. 2,143, dated June 26, 1841.

To all whom it may concern:

Be it known that I, WILLIAM W. HUBBELL, of Moyamensing, in the county of Philadelphia and State of Pennsylvania, have invented an Improvement in the Manner of Constructing Spark-Depositors or Apparatus for Preventing the Escape of Sparks and Dust from Chimneys of Locomotives, and other Steam-Engines; and I do hereby declare that the following is a full and exact description thereof.

In the accompanying drawing, A, A, represents a portion of the smoke box, which is surmounted by a drum B, B, and upon this is placed the chimney C, C, which is hinged at *a*, to the top of said drum, to admit of its being turned over when passing under bridges. Within the drum B, B, is contained the principal part of the apparatus by which the sparks are to be arrested and deposited.

D, D, is a cylinder of perforated metal, or of wire gauze, which is closed at its lower end by a plate of metal E, E. The part D, which is represented as projecting below the plate E, E, is shown as so placed to receive the ends of the exhaust steam pipes *b*, *b*, which may be made shorter than they must be without the use of this device; this, however, is not essential, and it is to be considered as merely a prolongation of D, D, and may be altogether omitted; the cylinder D, D, is left open at its upper end. Within B, B, there is another belt, or zone of perforated metal, or wire gauze, F, F, which is united to it at *c*, *c*, and extends up conically from it to an annular plate of metal *d*, *d*, by which F, and D, are united and the space between them is inclosed.

G, G, is an unperforated casing, or tube, of metal which is partly within, and partly below, the drum B, B. The part below is shown at G, G, Fig. 2, which is a view of the exterior of a part of the drum. The upper end of G, G, is, as shown in the drawing, at some distance from the plate *d*, *d*, as a part of the draft is to pass over this edge. The lower edge of the drum B, B, is united to the unperforated case G′, G′, by an annular plate of metal which forms an inclined plane, in order to cause the sparks that fall within the space between them to descend into a box, or receptacle prepared to receive them, and which is shown in section at H. The course of this inclined, annular plate is shown by the line *e*, *e*, Fig. 2, and by the line *e*, and the dotted line *e′*, *e′*, Fig. 1.

I, I′, is a tube, or pipe, leading from the drum B, B, at the lower edge of the inclined plate, into the receptacle H; this pipe is divided into two parts by a perforated diaphragm J, which extends from one side of it to the other; through the lowermost of these divisions, I, the sparks pass into the receptacle H, and the perforated diaphragm J, allows the steam and heated air by which they are urged forward to escape into the upper space I′ and thence through a tube K, K, into the upper part of the drum B, B, and thence into the chimney.

L, L, is a tube open at both ends, and supported by stays in the middle of D, D; its intention is to aid in directing the exhaust steam upward into the chimney and thus to prevent it from interfering, by its expansion, with the passage of the draft through the perforated metal.

Operation: The draft from the fire passes up into the space between the unperforated casing G, and the perforated casing D, through the perforations of which a large portion of it passes and enters the chimney. The sparks, with the remaining portion of the draft pass over the upper edge of G, into the space between it and the perforated metal plate F, F, and the sparks fall, or rather are forced down, on to the inclined, annular piece of metal which forms the bottom of this space, and is represented by the line *e*, *e*,; the larger portion of that part of the draft which passes over the top of G, G, finds its way through the perforations in the belt, or zone, F, F, into the space between it and B, B, and thence over the plate *d*, *d*, and into the chimney. A portion of the draft will accompany the sparks down the inclined plate *e*, *e*, and through the pipe I, into the receptacle H; and this portion will escape into the chimney by passing through the perforations in the diaphragm J, into the space I′, thence through the tube K, K, into the chimney; by this last arrangement, the portion of the draft which accompanies the sparks forcibly carries and deposits them in the box H, instead of allowing them to descend by their own gravity alone, as is generally the case in spark-arresters; in this particular, its operation is more efficient than any other instrument for the same purpose. By attaching the chimney to the

drum by means of a hinged joint, it can be lowered when necessary, so as to enable it to pass under the lowest bridges known on our railroads.

In order to allow direct draft into the chimney when the engine is not in action, I place valves, or shutters, on the bottom plate E, E, of the perforated cylinder D, D; these may be hinged or be made to slide, as may be preferred, there being rods to open or close them passing from them, and through the outer case of the apparatus.

Fig. 3, shows the under side of the cylinder D, D; and M, M, are two shutters, or valves, which may be opened, or closed, by means of the rods N, N.

Having thus, fully described the improvements in the spark depositor invented by me, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The particular manner in which I have combined and arranged the respective parts thereof, as herein set forth; that is to say, I claim, in combination, the perforated cylinder D, D, and the perforated belt, or zone, F, F, connected with each other by means of imperforated, annular plate *d*, *d*, the lower edge of F, F, being connected to the drum B, B, as described and represented.

2. I also claim, in combination, with each other, the so arranging of the inclined, annular plate of metal *e*, *e*, the tube I, I′, the perforated diaphragm J, and the tube K, as to conduct and deposit the sparks in the receptacle H, while that portion of the draft which accompanied them and forced them down, is allowed to escape into the chimney, in the manner set forth.

WM. W. HUBBELL.

Witnesses:
THOS. P. JONES,
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