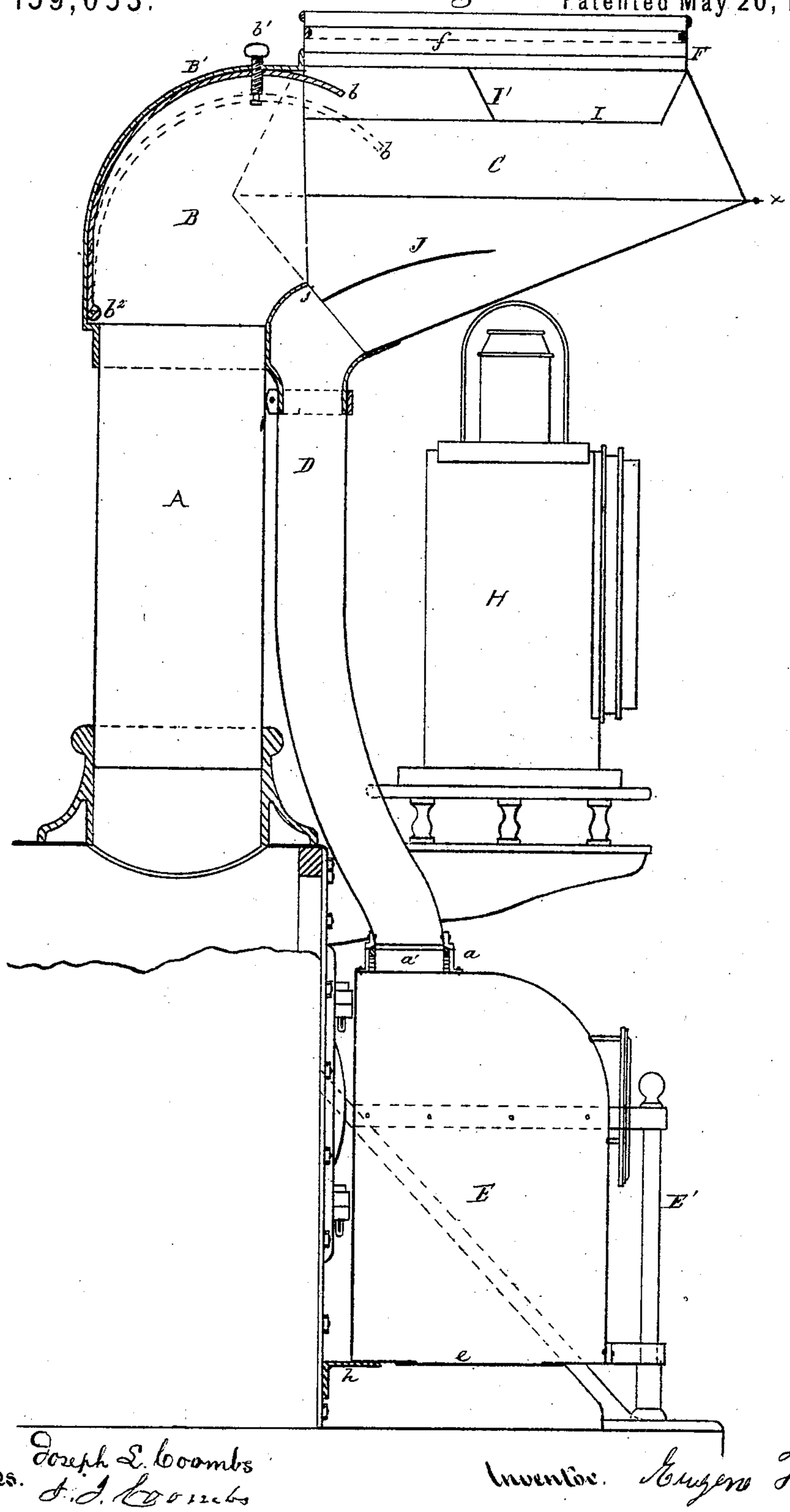
2 Sheets--Sheet 1.

E. FONTAINE.

Spark-Arresters.

No. 139,053. Patented May 20, 1873.

Fig. 1.



Witnesses. Joseph L. Coombs
J. J. Coombs

Inventor. Eugene Fontaine

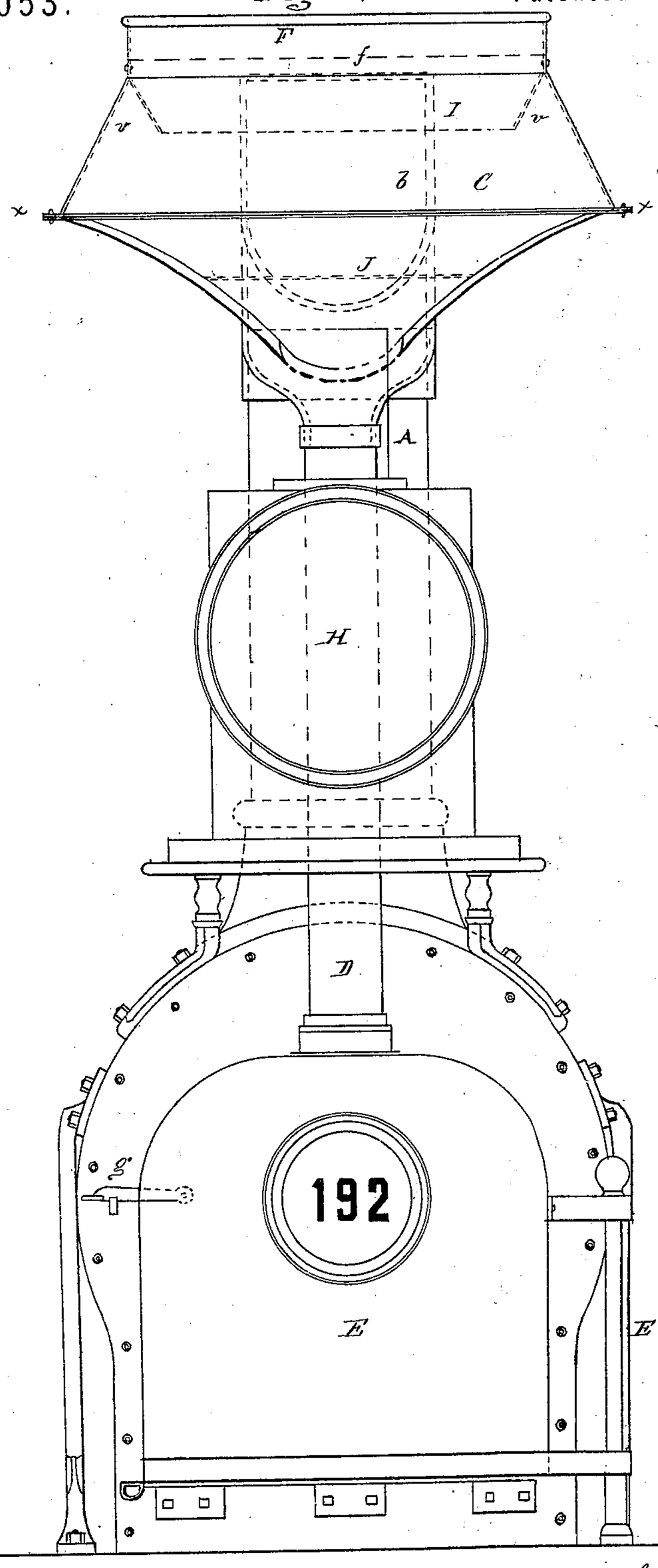
2 Sheets--Sheet 2.

E. FONTAINE.

Spark-Arresters.

No. 139,053. Patented May 20, 1873.

Fig. 2.



Witnesses. Joseph L. Coombs,
J. J. Coombs

Inventor. Eugene Fontaine

UNITED STATES PATENT OFFICE.

EUGENE FONTAINE, OF FORT WAYNE, INDIANA.

IMPROVEMENT IN SPARK-ARRESTERS.

Specification forming part of Letters Patent No. **139,053**, dated May 20, 1873; application filed April 17, 1873.

To all whom it may concern:

Be it known that I, EUGENE FONTAINE, of Fort Wayne, county of Allen and State of Indiana, have invented a Locomotive Spark-Arrester, of which the following is a specification:

My invention relates to a spark-arrester for a locomotive smoke-stack, especially adapted to a locomotive in which coal is used for fuel; and it consists primarily in the combination of a peculiar deflecting-cap on the top of the smoke-stack, a side box or chamber into which the smoke is deflected by said cap, with a wire-gauze cover for the upward escape of smoke and vapors, and a hopper-shaped bottom and descending conduit-flue to conduct the sparks, cinders, and other solid particles downward to the ground, or into a receiving box or receptacle.

In the accompanying drawing, Figure 1 is a sectional side view of my apparatus, and Fig. 2 is an end view of the same.

A is an ordinary cylindrical smoke-stack, and B a deflecting-cap on the top of the same. C is a smoke box or chamber located in front of the smoke-stack, opposite said deflecting-cap B, but it may be located in the rear. D is a conduit-pipe for carrying off the cinders, and E a box for receiving the same. The deflecting-cap B is rectangular in form, viewed in horizontal cross-section, but its back plate B′ is so curved as to form its top or cover as well as its back wall. C is a side box or chamber, into which the steam, smoke, and other escaping products of combustion are deflected by the cap B. This box or chamber is in form something like a double cone, having its largest circumference at *x*, below which it is hopper-shaped, while the upper part tapers inwardly up to the ring-flange F, in which its wire-gauze cover *f* has its seat. From the base of said ring-flange F, in the interior of the chamber, there is a downwardly-projecting annular conical flange, I, which encircles the interior of the chamber, except the throat or opening under the curved plate *b*, through which the smoke enters from the cap B. The conical form of this flange I makes a V-shaped annular space between it and the outer wall of the chamber, as shown at *v*. The back and upper part of the deflecting-cap B has a supplemental curved plate, *b*, hinged at b^2, and adjustable by means of a screw, b^1, to modify and affect the direction of the draft. I′ is a deflecting-plate of the same width as the flange I, extending across the chamber C, from side to side of said flange, to which its two ends are attached. J is another deflecting-plate extending across the lower portion of the chamber C, forming an inclined plane sloping toward the cinder-escape flue D, there being an opening from the upper side of said inclined plate at *j* into said flue D. E is a box located under the lower end of the pipe D to receive the ashes, cinders, and other solid particles precipitated in the box C, and discharged through said pipe or flue. This box is hinged at its outer left-hand corner to a vertical post, E′, so that it may be swung away from under the pipe D and emptied of its contents through a trap-door, *e*, in its bottom. Said cinder-box E connects with the pipe D by a detachable and flexible joint, *a*, which is formed by a ring on a spring-seat in a socket, *a′*, on the top of the box E, and the upper part of the ring is so beveled that, as the socket passes under the end of the pipe, the ring will be depressed, but will rise again when fairly under the pipe, so as to form a sufficiently close joint. When the box E is closed under the pipe it is secured by a latch, *g*, and its inner side is supported by an angle-iron, *h*, attached to the front of the steam-box under the arch. The box E, however, may be wholly dispensed with, in which case the cinders and other solid substances precipitated in the steam-box C will be thrown upon the ground through the flue D.

The smoke, steam, and other products of combustion passing through the smoke-stack are deflected by the curved back and top of the cap B into the box or chamber C, and the downward pitch of the front part of said curved plate *b* directs the current toward the bottom of said box, the inclined plate I co-operating with the curved plate *b* to throw the current downward. This downward tendency of the draft precipitates all the cinders and solid particles in the box C, while the smoke and other vapors, from their levity, speedily mount up again and pass out through the wire-gauze cover *f*. The inclined plate J arrests

the downward current before it reaches the bottom of the hopper, while the cinders and other solid particles fall upon said inclined plate, or on the hopper-bottom beyond it; and in either case they will run down the incline into the escape-flue D, and will be conducted by it either into the cinder-box E or to the ground, as the case may be. The inclined annular flange I arrests the upward tendency of any sparks and cinders that may be carried up around the wall of said chamber C by the reaction of the steam and smoke in said chamber.

It will be seen that there is no opening in the inclined side of the hopper-bottom of the smoke-chamber opposite to the smoke-stack, upon which the sparks and cinders are chiefly thrown by the current from the deflecting-cap B, and the opening for the escape of the cinders being in the inclined side of the hopper next to the smoke-stack, and covered by the deflecting-plate J, the sparks and fiery particles cannot be driven directly down the escape-flue D by said current, but are detained in the chamber C until the fire is effectually extinguished by the steam in said chamber, so that few if any live sparks ever escape therefrom, either through the wire-netting or the flue D.

H is an ordinary head-light, which forms no part of my invention, and is shown in the drawing merely to point out its location.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the smoke-stack, the deflecting-cap with curved top, the smoke-chamber with wire-gauze cover and hopper-shaped bottom having no opening in the inclined side opposite the smoke-stack, and the escape-flue for the cinders, all constructed and arranged to operate substantially as described.

2. In combination with the deflecting-cap B, the smoke-chamber C, and escape-flue D, the hinged cinder-box E, constructed and arranged to operate substantially as described.

3. In combination with the adjustable curved plate *b* of the deflecting-cap and the smoke-chamber C, the deflecting-plate I′ in said chamber.

4. In combination with the deflecting-cap with its curved plate *b*, and the smoke-chamber with its hopper-shaped bottom having no opening in the inclined side opposite the smoke-stack and discharge-flue, the deflecting-plate J, arranged to operate substantially as described.

5. In combination with the deflecting-cap B and smoke-chamber C, the annular conical flange I, substantially as and for the purpose described.

6. In combination with the escape-pipe D and hinged cinder-box E, the flexible and detachable joint *a*, substantially as described.

EUGENE FONTAINE.

Witnesses:

JOSEPH L. COOMBS,

J. J. COOMBS.