(No Model.)

H. W. LIBBEY.

SPARK ARRESTER.

No. 381,707. Patented Apr. 24, 1888.

Fig. 1.

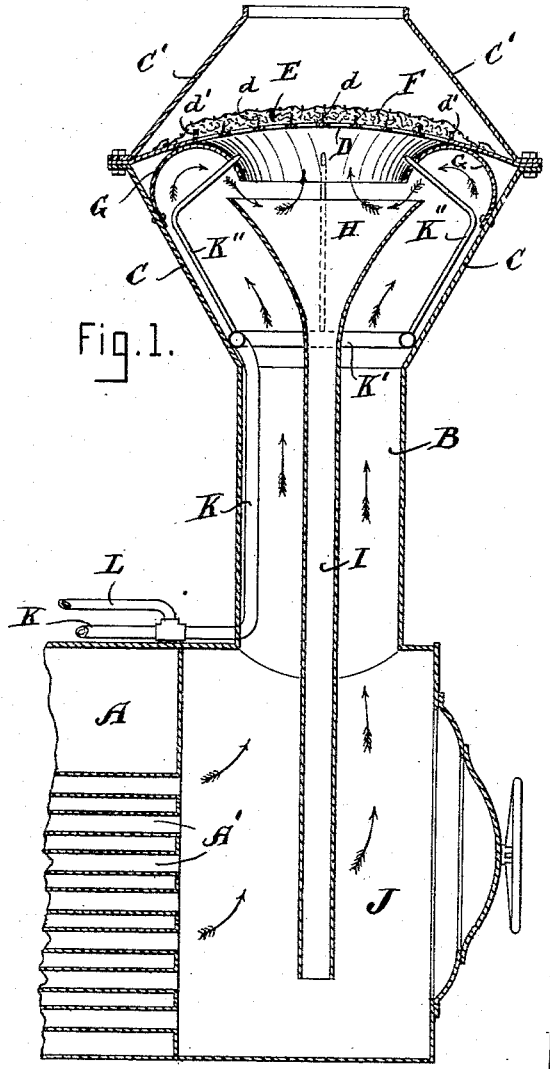


Fig. 3.

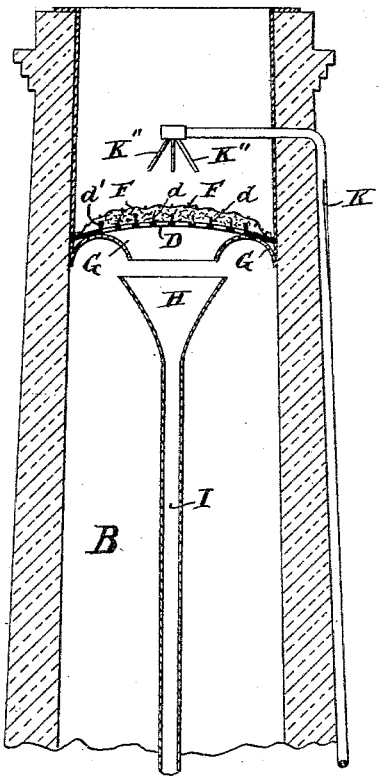
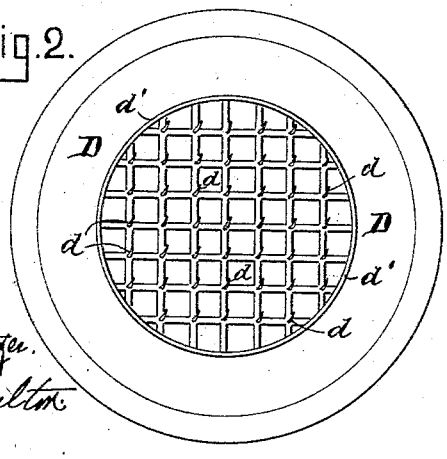


Fig. 2.



Witnesses.
J. Geo. Seltzer.
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UNITED STATES PATENT OFFICE.

HOSEA W. LIBBEY, OF BOSTON, MASSACHUSETTS.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 381,707, dated April 24, 1888.

Application filed June 30, 1887. Serial No. 243,046. (No model.)

To all whom it may concern:

Be it known that I, HOSEA W. LIBBEY, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Spark-Arresters, of which the following is a specification.

The object of my invention is to arrest the sparks and purify, filter, or liquidize the smoke from locomotives, chimneys, &c., so that the products of combustion escaping into the funnel or chimney will not vitiate the atmosphere.

The invention consists in placing near the top of the funnel or chimney a filter of sponge held between an iron grating and wire-netting and kept in a moist or wet state by exhaust-steam or other means, thereby holding the smoke in check until it is liquidized and then drops down and out of an escape-pipe.

Referring to the accompanying drawings, Figure 1 represents the funnel of a locomotive embodying my invention. Fig. 2 is a plan or top view of the grating. Fig. 3 shows the invention applied to a chimney-stack.

A represents a portion of a locomotive, B the funnel, and C C' the head. I prefer to make the head in two parts and bolt them together, with the perforated plate or grating D between them. On the top of the grating D, I place a layer of sponge, E, and secure it in position by pins or hooks *d*, attached to the grating D, as shown in Fig. 2, and by a wire-netting, F, secured in any suitable manner to the plate D. By means of the pins or hooks *d*, secured to the grating D, the sponge or other suitable material is kept from shifting by the jolting of the locomotive, and is thus always kept in the proper position and will not work to one side. To the lower portion, C, of the head I secure a deflector, G, the mouth of which stands over the flaring mouth H of the pipe I, that leads to the bottom of the chamber J at the end of the locomotive.

K is a pipe connected to the exhaust-steam pipe of the locomotive and passes into the funnel B, and is connected to a pipe, K', bent into a circular form, and from which two or more (preferably four) small jet-pipes, K", project, the outer ends of which are so directed that when exhaust-steam is admitted into the pipe K it will pass up and out of the jet-pipes K", so as to impinge upon the sponge E and keep it in a wet condition.

The smoke and sparks passing through the tubes A' and up the funnel B come into contact with the deflector G and are carried in the direction of the arrows. The larger cinders will then fall into the mouth H of pipe I and be carried to the bottom of the chamber J; but the finer cinders and the smoke will pass upward and come into contact with the wet sponge E, and all the carbon will be removed therefrom and be carried down into the mouth H by the condensed steam held in the sponge E.

To prevent the sponge being burned when first starting the fire, I connect to the pipe K a pipe, L, the other end of which is connected to a small force-pump connected to the water-tank, so that the engineer can give a few strokes to the pump and force water through the pipe L to the pipes K" sufficient to wet the sponge until steam has been generated to keep it in a moist condition.

Both the pipes K and L may be fitted with back-pressure valves.

In Fig. 3 I have shown my invention as applied to a chimney-stack, and instead of having exhaust-steam entered on the under side of the sponge I have shown a sprinkler above the sponge, which may be used for steam or water.

In the drawings I have shown the pipe I terminating in the chamber J; but it may be carried to the fire-box, ash-pit, or out, so as to allow the cinders, &c., to fall onto the ground.

It will be seen that the exhaust-steam or water constantly impinging upon the sponge keeps it clean, and consequently a free draft. The condensed steam or water dripping from the filter carries the sparks and smoke in liquid state through the pipe I to the bottom of the chamber J, or to any other desired place, and keeps the pipe I free from obstruction.

To prevent the water, &c., running to the side of the funnel on the top of the plate D, I provide a rim or flange, *a'*, on said plate, as shown.

What I claim as my invention is—

1. In a funnel or chimney, B, the combina-

tion of a filter of sponge, the deflector G, and pipe I, provided with a flaring mouth, H, substantially as shown and described.

2. In a funnel or chimney, the perforated plate or grating D, sponge E, and wire-netting F, the deflector G, and pipe I, with flaring mouth H, in combination with the pipe K K′, provided with jets K″, for causing water or steam to impinge upon the sponge, substantially as and for the purposes set forth.

3. In a funnel or chimney, a filter of sponge, in combination with jets of steam or water, substantially as and for the purposes set forth.

4. In a funnel of a locomotive, a filter of sponge, in combination with the grating D, provided with pins or hooks *d*, for preventing the sponge from shifting, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HOSEA W. LIBBEY.

Witnesses:
L. W. HOWES,
E. PLANTA.