B. V. CRUMRINE.
Spark-Extinguisher.

No. 198,796. Patented Jan. 1, 1878.

Fig. 2.

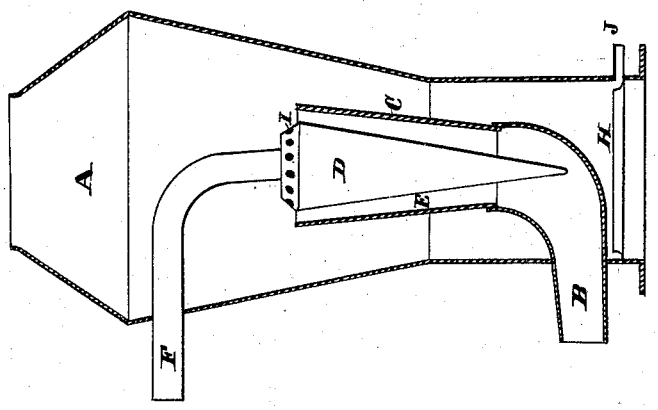
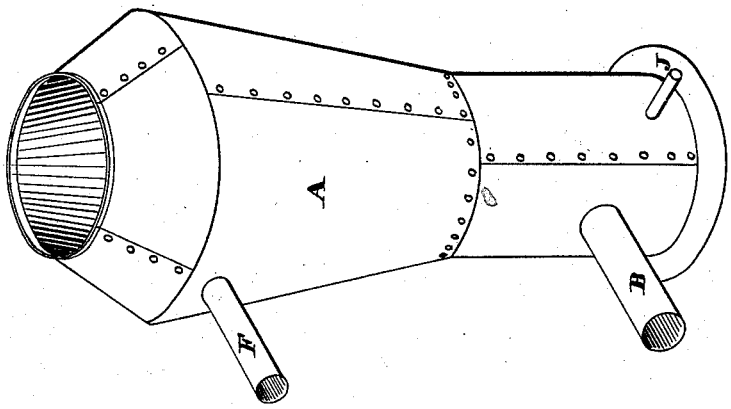


Fig. 1.



Witnesses
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UNITED STATES PATENT OFFICE.

BENTON V. CRUMRINE, OF YUBA CITY, CALIFORNIA.

IMPROVEMENT IN SPARK-EXTINGUISHERS.

Specification forming part of Letters Patent No. **198,796**, dated January 1, 1878; application filed November 21, 1877.

To all whom it may concern:

Be it known that I, BENTON V. CRUMRINE, of Yuba City, county of Sutter, and State of California, have invented an Improved Spark-Extinguisher for Locomotives and Chimneys; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

My invention relates to a novel device for extinguishing the sparks which escape from locomotives, smoke-stacks, and the chimneys of steam-boilers generally; and it consists of a shell and cone placed within the smoke-stack or chimney, and secured to the exhaust-pipe in such a manner as to cause the exhaust-steam to be deflected in a current against the sides of the stack or chimney, which current will carry the sparks, as they rise in the smoke-stack or chimney, against its wet, damp sides and extinguish them.

My invention also consists of a device for admitting water into the chimney or stack through holes perforated in the cone, so as to aid in extinguishing the sparks, this device being so constructed that the flow of water can be controlled at pleasure.

My invention will be more fully described in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view; Fig. 2, a vertical section.

In the present instance I have shown my invention as applied to the smoke-stack of a locomotive; but the working and arrangement will be the same in any chimney to which it may be applied.

Let A represent the smoke-stack of a locomotive, and B the exhaust-pipe, the escaping steam from which creates a draft through the smoke-stack. On the inner end of this exhaust-pipe B, I secure a vertical hollow shell, C, which is slightly conical in form, being larger at the top than at the bottom, where it is connected with the exhaust-pipe.

Within this shell C, I suspend a hollow cone, D, with its apex downward. The diameter of this cone at the base I make smaller than that of the shell C, so that as it hangs in the shell an annular flaring space, E, is formed between the shell and the cone, through which the exhaust-steam must pass as it rises.

The hollow cone D is suspended by a water-pipe, F, which enters the side of the stack above the cone, while its opposite end connects with the feed-pump, or with the water in the boiler below the water-line, or at any convenient point where a supply of water can be obtained.

Around the upper periphery of the cone D, at its base or larger end, I make numerous small holes or perforations, I.

Below the entrance of the exhaust-pipe B, and on the inside of the stack, I form a trough, H, with an outlet-pipe, J, at its lowest point.

The operation of the device is then as follows: The exhaust-steam which escapes through the smoke-stack, and thus forms a draft to aid in the combustior of the fuel beneath the boiler, must, as it rises in the exhaust-pipe, pass through the space E between the cone D and the inner surface of the shell. The direction of this space or passage causes the escaping steam to be deflected against the sides of the smoke-stack in an oblique current, so that the sparks, as they rise in the smoke-stack, are carried by and with this current of steam against the sides of the stack.

The sides of the smoke-stack are wet from the moisture of the escaping steam and vapor, and as the sparks come in contact with the wet sides of the stack they are extinguished.

When it is desired, water can be admitted through the pipe F, and will be forced through the perforations I in the cone in a fine spray, thus aiding in extinguishing the sparks.

The trough H around the inside of the smoke-stack catches and carries off through the outlet J all water that may run down the sides, and thus prevents it from passing into the combustion chamber.

The draft may be changed or regulated, if desired, by raising or lowering the cone in the shell, and thus increasing or decreasing the freedom of the exhaust, provided at all times that the area of the space between the cone and the shell is equal to that of the exhaust-pipe. The amount of water which is admitted through the cone into the smoke-stack can also be regulated, as described.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The hollow tapering shell or cylinder C, attached to the exhaust-pipe inside of the smoke-stack of a steam-boiler, and having the cone D secured inside of it, so as to provide an annular space around it, which will deflect the exhaust-steam against the sides of the stack, substantially as and for the purpose described.

2. The tapering shell or cylinder C, attached to the exhaust-pipe inside of the smoke-stack, in combination with the hollow cone D, with its perforations I, and the suspending water-pipe F, substantially as and for the purpose described.

In witness whereof I have hereunto set my hand and seal.

BENTON V. CRUMRINE. [L. S.]

Witnesses:

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