W. H. MALLORY.

SPARK-ARRESTER AND CONSUMER.

No. 174,141. Patented Feb. 29, 1876.

fig. 1

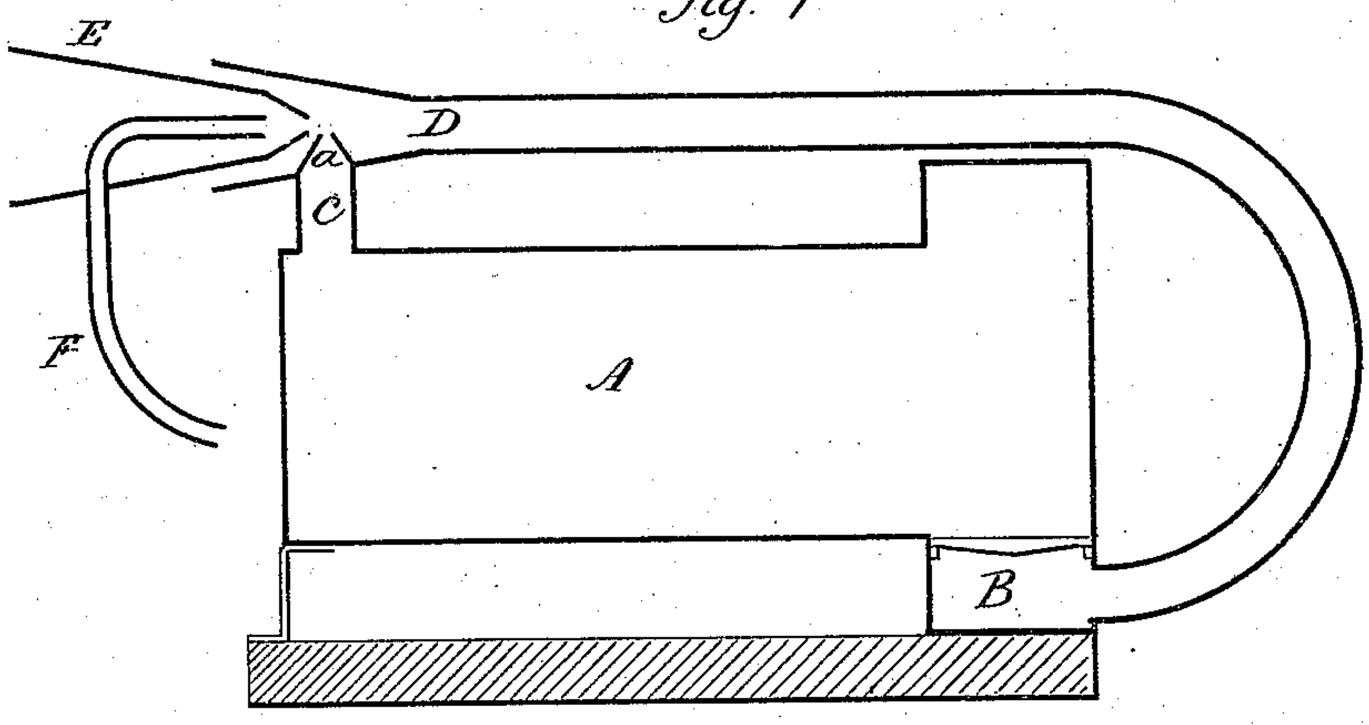
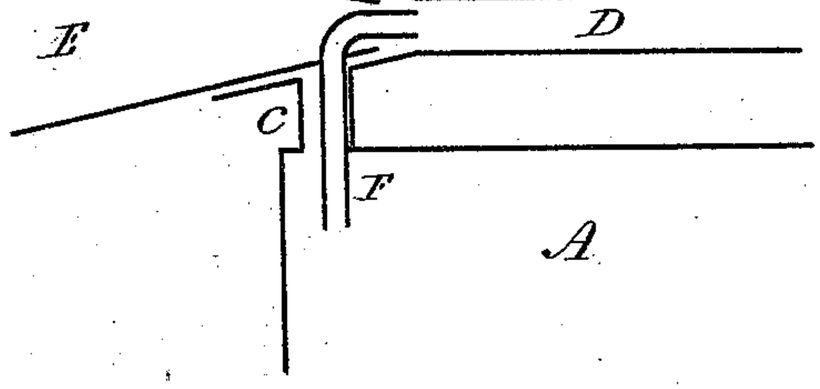


fig. 2.



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UNITED STATES PATENT OFFICE.

WILLIAM H. MALLORY, OF BRIDGEPORT, CONNECTICUT.

IMPROVEMENT IN SPARK ARRESTERS AND CONSUMERS.

Specification forming part of Letters Patent No. **174,141**, dated February 29, 1876; application filed October 6, 1875.

To all whom it may concern:

Be it known that I, WILLIAM H. MALLORY, of Bridgeport, in the county of Fairfield and State of Connecticut, have invented a new Improvement in Blasts for Locomotive and other Boiler Furnaces; and I do hereby declare the following, when taken in connection with the accompanying drawings, and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, longitudinal section; Fig. 2, modification.

This invention relates to an improvement in the method of creating or accelerating a draft for the fires of steam-boilers, particularly designed for boilers on locomotives, steamboats, and similar classes, the object being principally to utilize the exhaust and that combined with the movement of the locomotive or steamer, as the case may be, to return the products of combustion to the fire, and, at the same time, create a blast for the fire, as more fully hereinafter described.

A represents a boiler; B, the fire-box; and C, the smoke-stack, of substantially the usual or any known construction. This smoke-stack C opens into a flue or pipe, D, running to below the fire-grate, the mouth of the pipe D extending forward of the smoke-stack and somewhat expanding into funnel shape.

In this mouth a second funnel-shaped or auxiliary mouth is introduced, contracted at its rear end, and opening in close proximity to a correspondingly-contracted mouth of the smoke-stack.

F is the exhaust-pipe, which turns into the mouth E, and opens near the inner end, so as to direct the exhaust to the exit and in line across the opening of the smoke-stack.

With this construction suppose the movement to be forward, as indicated by the arrow, a large amount of air enters through the mouth E, as well as through the mouth of the flue D, and, by the contraction of the mouth E, the air is forcibly driven to the rear over the opening *a* in the smoke-stack, and there creates a correspondingly strong draft up through the smoke stack, and to the rear, carrying the products of combustion, with power proportioned to the velocity, around to the fire, where the products of combustion will be consumed, and, at the same time, a blast created for the fire.

The exhaust, which enters through the pipe F, is forced across the opening of the smoke-stack in like manner as described for the air, and, to that extent, increases the draft, as well as forces the exhaust steam with the products of combustion back to the fire, where the steam aids combustion, and the blast increases the draft.

When stationary, or in stationary boilers, the exhaust may be used in like relation to the opening of the smoke-stack, with a corresponding favorable result, or, instead of the exhaust, a jet of live steam will accomplish the same result.

A single mouth only is necessary on moving boilers. The two, as shown, are, however, preferable as admitting a larger amount of air.

In Fig. 2 the exhaust is shown as running through the smoke-stack and turned back through the rear or contracted ends of the mouths, and in rear of the opening of the smoke-stack, so that a draft from the smoke-stack is created instead of over it, as first represented, the result and principle, however, being substantially the same—that is to say, the automatic combined steam and air blast to carry the products of combustion directly to the fire to increase the draft and aid in supporting combustion.

I claim—

1. In combination with the smoke-stack or discharge from a steam-boiler furnace, a flue leading from the exit of the said smoke-stack directly to the fire, the forward end of the said flue open to the atmosphere, and a steam-jet turning into the said flue toward the fire, substantially as specified.

2. The smoke-stack or discharge from a steam-boiler furnace, contracted at its exit, combined with an open flue leading from the said discharge directly to the fire, and a steam-jet across the said contracted exit of the smoke-stack, substantially as set forth.

3. The smoke-stack or discharge from a steam-boiler furnace, contracted at its exit, combined with a flue leading from the said discharge directly to the fire, and a funnel-

shaped mouth, E, contracted toward the contracted end of the smoke-stack, and at right angles thereto, substantially as described, so as to create a blast across the said contracted end of the smoke-stack, substantially as specified.

4. The smoke-stack or discharge from a steam-boiler furnace, contracted at its exit, combined with a flue leading from the said discharge directly to the fire, a funnel-shaped mouth, E, contracted toward the contracted end of the smoke-stack, and at right angles thereto, and a steam-jet directed into the contracted end of the mouth across the contracted end of the smoke-stack, substantially as set forth.

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