W. F. GRASSLER.

Locomotive Boiler Furnace.

No. 167,448. Patented Sept. 7, 1875.

Fig. 1.

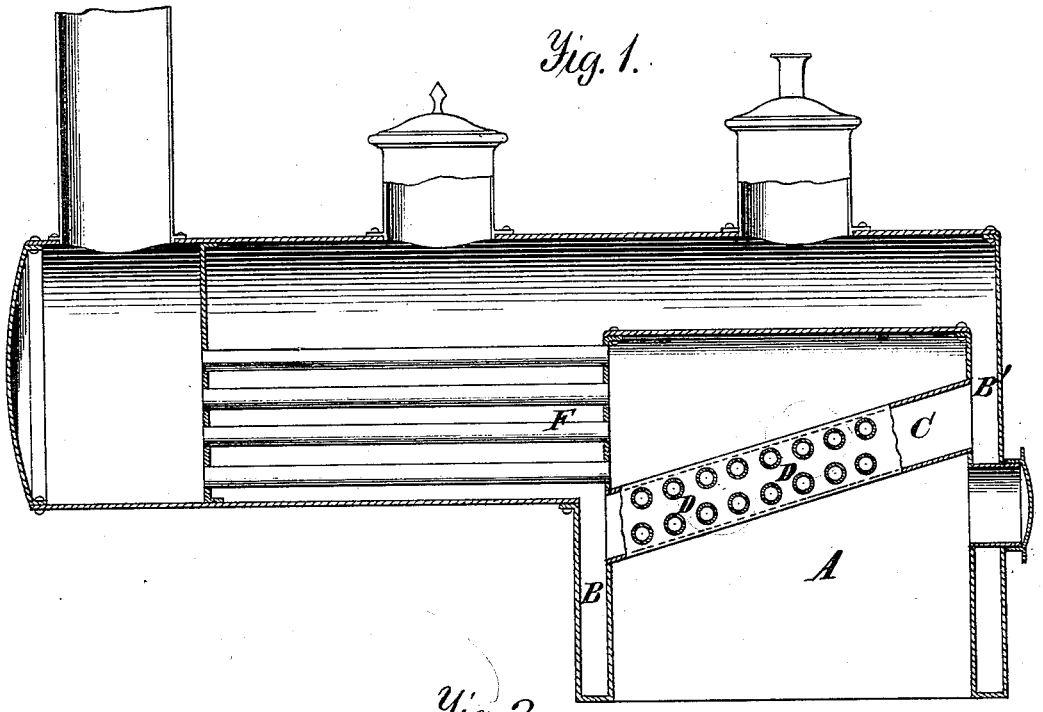


Fig. 2.

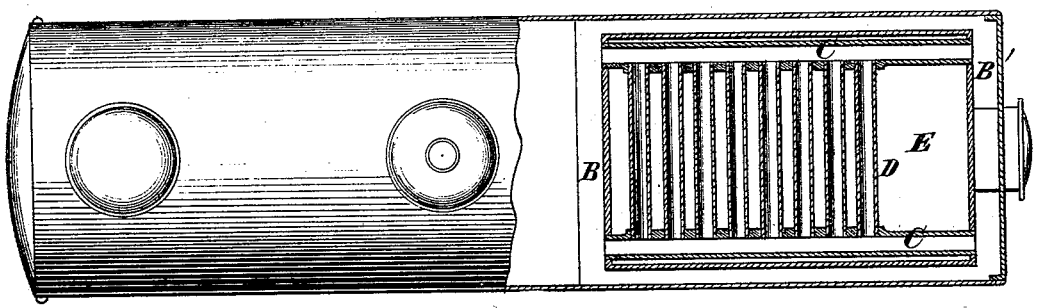
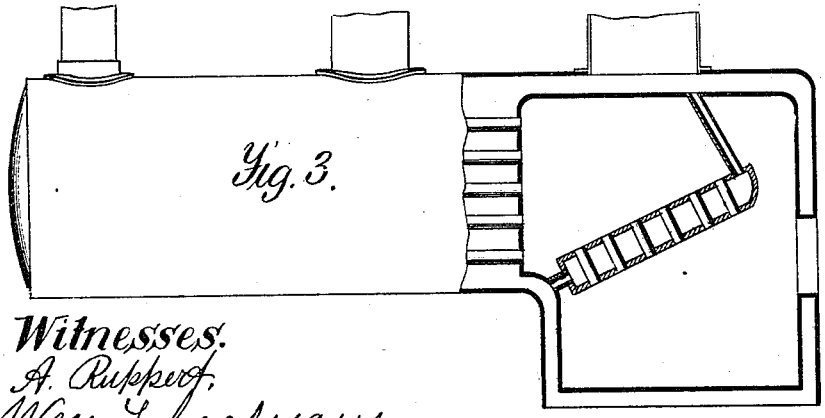


Fig. 3.



Witnesses.
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Wm F. Cochrane

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UNITED STATES PATENT OFFICE.

WILLIAM F. GRASSLER, OF MUNCY, PENNSYLVANIA.

IMPROVEMENT IN LOCOMOTIVE-BOILER FURNACES.

Specification forming part of Letters Patent No. **167,448**, dated September 7, 1875; application filed August 16, 1875.

To all whom it may concern:

Be it known that I, WILLIAM F. GRASSLER, of Muncy, in the county of Lycoming and State of Pennsylvania, have invented a new and useful Improvement in Steam-Generators, of which the following is a specification:

My invention is particularly designed for application to tubular boilers of the locomotive type; and consists in placing in the upper part of the fire-box a transverse tube on each side extending between the front and back water-legs, and connecting such tubes by short transverse pipes containing water.

In the annexed drawing, Figure 1 is a vertical longitudinal section of a locomotive-boiler. Fig. 2 is a plan partly in horizontal section, and Fig. 3 is a modified form in which the sheets are placed one above the other and connected by vertical pipes, through which the draft passes.

In the annexed drawings, A is the fire-box and B B′ are the water-legs. Two parallel tubes, C C, extend across the fire-box and open into the water-space of the front and back water-legs. These are connected by short transverse tubes D D, which in the case illustrated are in two rows, but may be in one or more than two. The effect of this arrangement of pipes C and D is to make a water-bridge not sufficiently tight entirely to divert the draft, as in the case of the solid water-bridge heretofore known, but tending to throw the draft back and through the space E left, as shown, and thence passing over the tubes D into the longitudinal tubes F. The draft will, however, rise through the interstitial spaces between the tubes D and highly heat the water circulating through them. An incidental advantage resulting from this arrangement of the water-bridge flues will be that, receiving the first intensity of the heat of the fuel on the grates, the flat crown-sheet, always the most exposed part of the boiler, will be greatly relieved, the form of the flues better fitting them for sustaining the intense heat. Besides this, and in consequence of the great heat to which the pipes D are exposed, the rapid generation of steam therein will tend to promote a more active circulation of water along the surfaces of the legs.

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

1. In combination with fire-box and water-legs, the tubes C, and transverse tubes D, substantially as set forth.

2. In combination with the fire-box of a locomotive-boiler, a transverse water-bridge formed by the pipes C and D, when the latter are placed in front of the fire-box, and arranged so as to impede the circulation only in that part of the box, the space at E being left open, substantially as set forth.

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

WILLIAM F. GRASSLER.

Witnesses:

MATHIAS WELLINER,

JOHN ADLUM.