

B. L. Griffith,

Steam-Boiler Fire-Tube.

N^o 24,862.

Patented July 26, 1859.

Fig. 1.

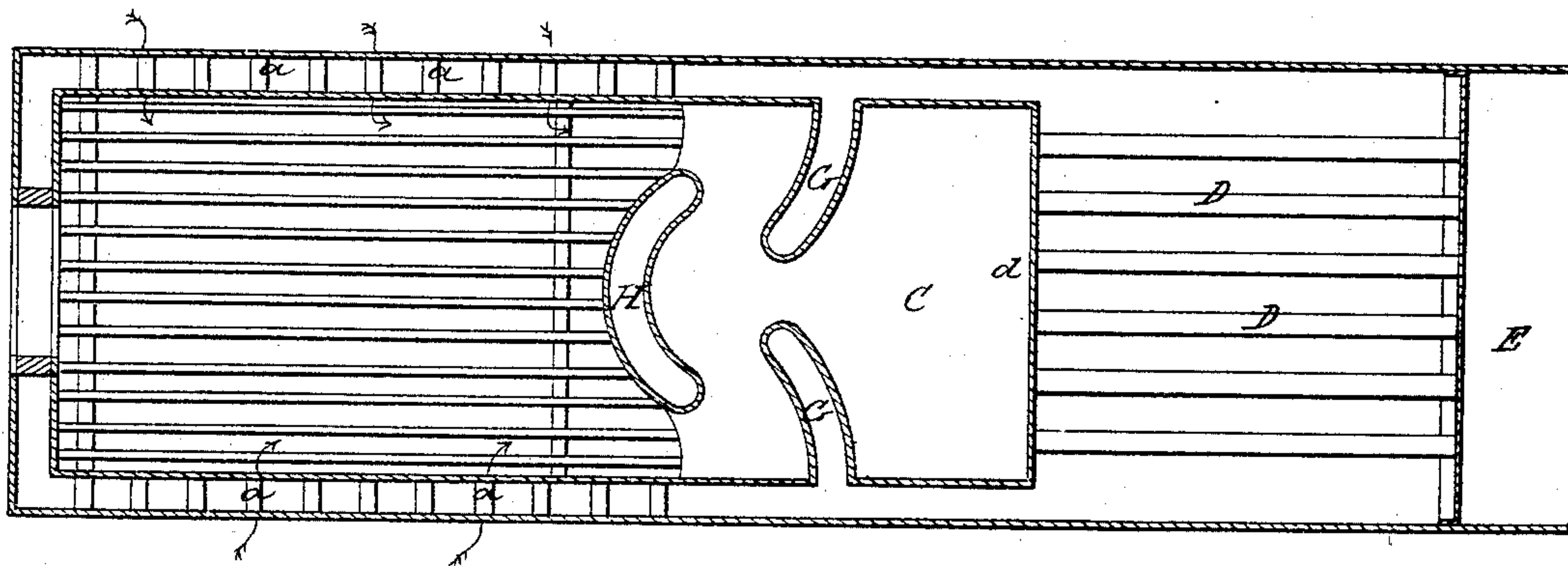


Fig. 2.

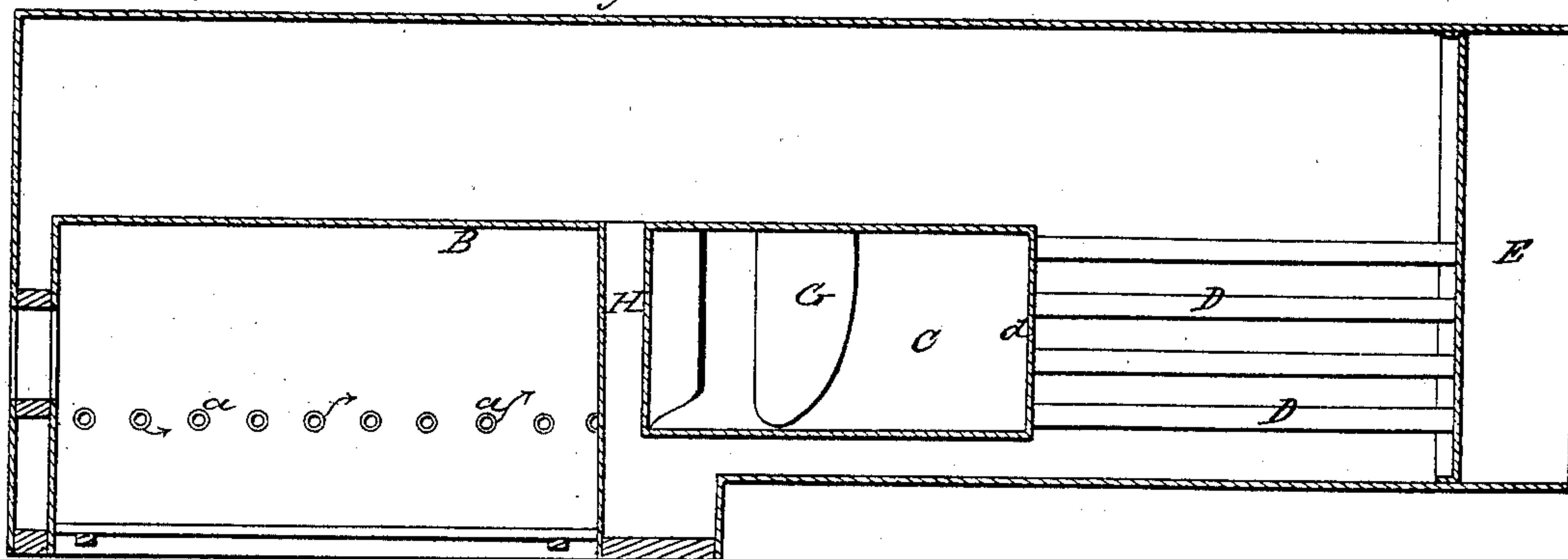
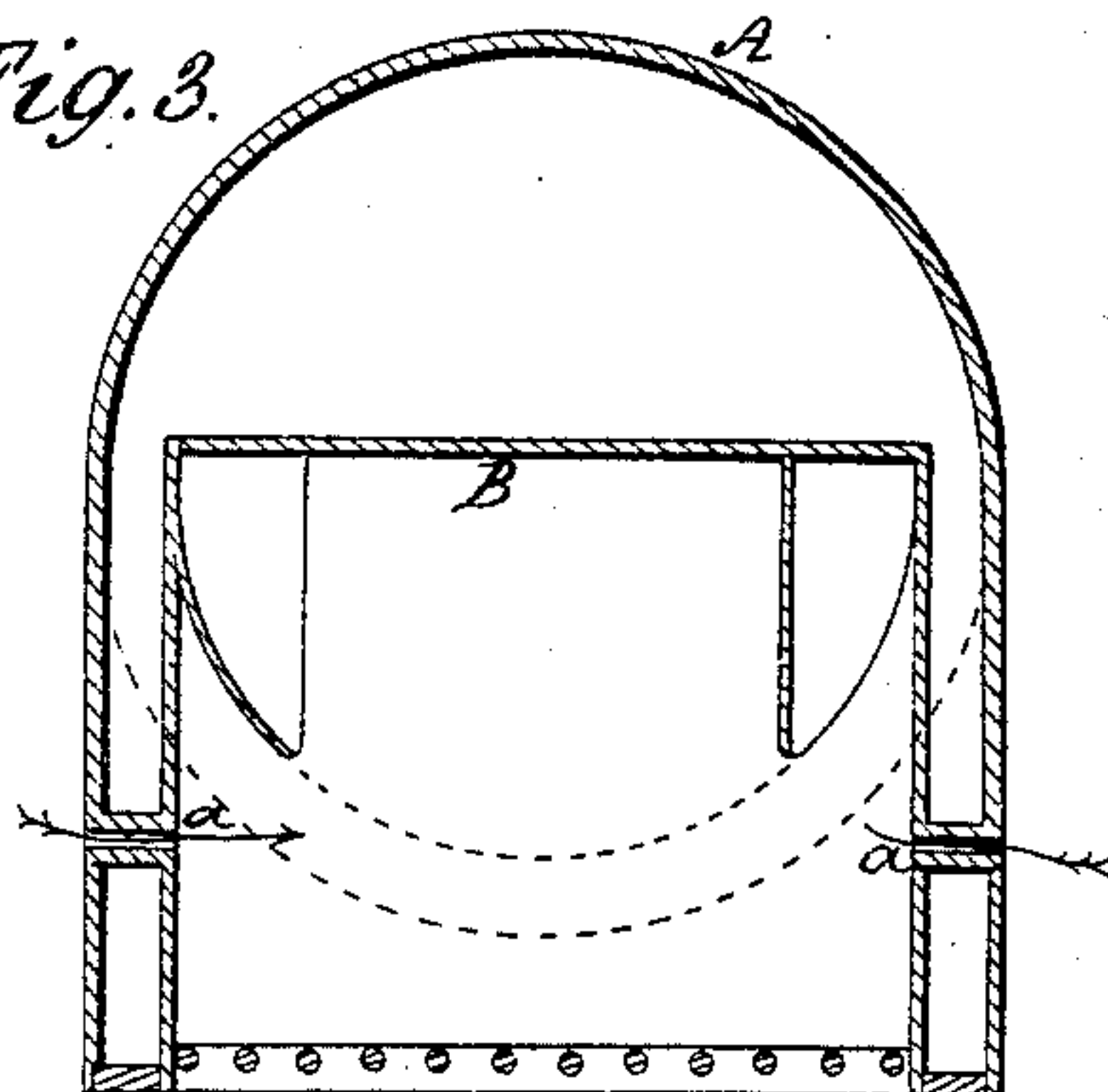


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

BENJAMIN L. GRIFFITH, OF HAZLETON, PENNSYLVANIA.

IMPROVEMENT IN LOCOMOTIVE-BOILERS.

Specification forming part of Letters Patent No. 24,862, dated July 26, 1859.

To all whom it may concern:

Be it known that I, BENJAMIN L. GRIFFITH, of Hazleton, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Improvement in Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists in certain deflectors arranged within a space between the fire-box and tube-plate of a locomotive-boiler, substantially as described hereinafter, in combination with openings in the side of the fire-box for the admission of jets of atmospheric air, so that the latter may be thoroughly mixed with the gaseous products of combustion as they pass from the fire-box and impinge against the deflectors, thereby igniting the gases, which would otherwise pass off unconsumed to the chimney.

In order to enable others to make and use my invention, I will now proceed to describe its construction and the effect produced.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a sectional plan of my improved steam-boilers; Fig. 2, a longitudinal sectional elevation; Fig. 3, a transverse sectional elevation through the fire-box.

Similar letters refer to similar parts throughout the several views.

As regards exterior form, my improved boiler is similar to those used in connection with locomotive steam-engines.

A is the outer shell of the boiler; B, the fire-box; C, a chamber between the tube-sheet *d* and the fire-box; D, the tubes, and E the smoke-chamber.

The sides of the fire-box B are stayed to the shell of the boiler by bolts, which are of the usual construction, except such as are situated at or near the top of the fuel, the row of stay-bolts at this point, and represented at *a a*, being tubular, so that the external air may pass through them into the fire-box.

Within the chamber C are three water-spaces, G, G', and H, which I term the "deflectors," the deflector H being at the far end of the fire-box, situated midway between the sides of the same, and of such a width as to allow sufficient opening on each side for the passage of the products of combustion. The deflectors G and G' are situated—one on each side of the space *c*—opposite to each other and

about midway between the deflector H and the tube-sheet *d*, the space between the ends of the two deflectors being sufficient to allow for a free passage of the products of combustion. The deflector H is convex on the side nearest the fire-place and concave on the opposite side, and the deflectors G and G' may project at right angles from the sides of the boiler into the space *c*, although I prefer making them of the curved form represented in drawings, Fig. 1.

The products of combustion passing from the furnace strike the deflector H and are directed by the curved form of the latter to the openings on each side, through which they pass, and, striking the deflectors G and G', recoil from the latter, strike against the concave side of the deflector H, recoil from thence, and pass through the space between the deflectors G and G' toward the tubes D, through which they pass into the smoke-box E, and from thence to the chimney. The cold air entering through the hollow stay-bolts *a a* takes the same course as the products of combustion, and becomes thoroughly mixed with the latter by coming in contact with and being agitated by the deflectors, so that on reaching the rear of the chamber C the gaseous products of combustion become thoroughly ignited by being mixed with the air, and pass in the form of a flame through the tubes D.

Although I have illustrated and described the deflectors G, G', and H as forming water-spaces, they will serve precisely the same purpose if made of fire-brick or other suitable material.

I do not claim, broadly, deflectors situated in the interior of steam-boilers for the purpose of mixing the gaseous products of combustion with atmospheric air; but

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

The deflectors G, G', and H, arranged within the space *c*, between the fire-place and the tube-sheet of a locomotive-boiler, substantially as described, in combination with openings in the fire-box for the admission of atmospheric air, for the purpose specified.

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

B. L. GRIFFITH.

Witnesses:

GEORGE SEIPP,
GEORGE A. BIERAU.