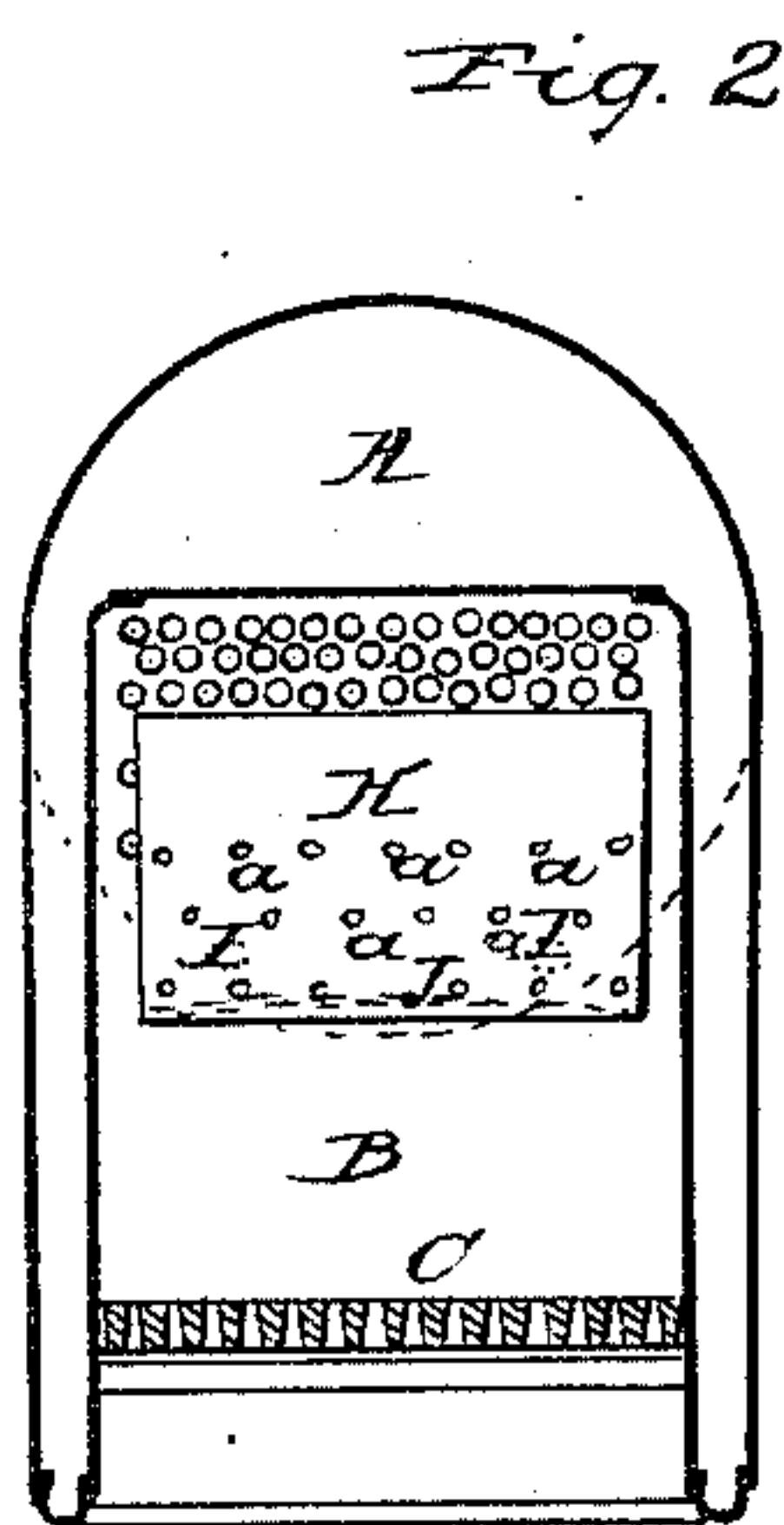
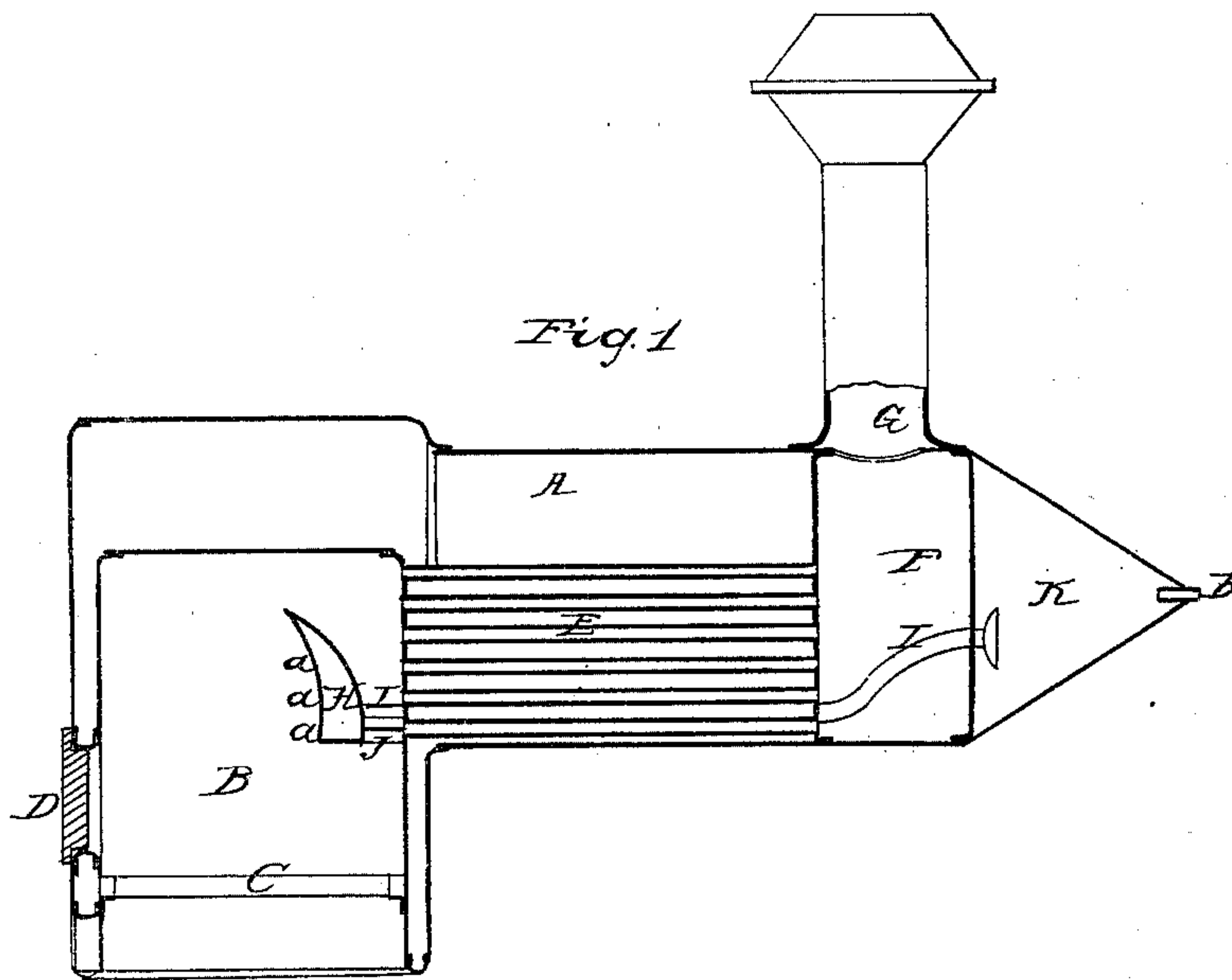


J. Amory,
Steam-Boiler Furnace.
N^o 80,265. Patented July 28, 1868.



Witnesses
N. B. Lombard
David Gray.

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United States Patent Office.

JONATHAN AMORY, OF WEST ROXBURY, MASSACHUSETTS.

Letters Patent No. 80,265, dated July 28, 1868.

IMPROVEMENT IN STEAM-GENERATORS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JONATHAN AMORY, of West Roxbury, in the county of Norfolk, and State of Massachusetts, have invented certain Improvements in Boilers for Locomotives, and other purposes; and I do hereby declare that the following is a full, clear, and exact description of the same, taken in connection with the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical sectional elevation of a locomotive-boiler, with my improvement applied thereto, and

Figure 2 is a transversed section of the same, through the fire-box.

The subject-matter of my invention relates to the construction and application to a boiler of certain devices to enable it to produce a more perfect and economical combustion of the fuel, which devices are especially applicable to locomotive-boilers.

My invention consists, in the first place, in the employment, in the fire-box of a boiler, of a hollow curved heating-chamber, technically called a curve, which extends across the fire-box, and forms a curved bridge in the same, and a means for supplying hot air to the combustible gases that arise from the fuel, and is similar in purpose to the curves used in boilers, as heretofore patented by me. This curved chamber is so constructed as to introduce and mix with the said gases the amount of hot air that is necessary to complete the combustion, as will be more fully described.

My invention consists, in the second place, in the employment, upon the front end of a locomotive-boiler, of a conical chamber, from which the air is taken which supplies the curve, by which means the supply of air to the curves can be better regulated, and is less disturbed by the action of the wind, and the resistance of the air to the locomotive is diminished when running at a high velocity.

In the drawings, A is the boiler, B the fire-box, C the grate, D the door, E the tubes, F the smoke-box, and G the smoke-pipe, all constructed in the usual manner. H is a hollow curved chamber, made of thin metal, which extends across the fire-box, nearly filling the entire width, and called the curve.

It is placed just in front of the tubes, as shown, leaving only a space sufficient to afford a proper passage for the products of combustion into the tubes E.

The space between the bottom of the curve and the tube-sheet is closed by the plate J, by which all the products of combustion are compelled to pass up in front of the curve, and directed toward the opposite side of the fire-box.

That side of the curve toward the fire is pierced with numerous small holes, *a a*, &c., from which the hot air from the interior of the curve is discharged in fine streams among the products of combustion, as they rise from the fuel and pass by its surface. The gases, by their convolutions and reverberations against the sides of the fire-box, and also in passing over the top of the curve into the space between the curve and the tube-sheet, are intimately mixed, and their combustion is thoroughly completed before they reach the tubes, even when bituminous fuel is used. The curve is supplied with air by the pipes I, which lead from its interior through the boiler-tubes to the front of the boiler, as shown.

The air, in addition to its being heated in the curves, also serves a very important purpose in carrying away the heat from them and preserving them from rapid destruction by the intense heat in the fire-box. In order to consume the fuel to the best advantage, it is necessary to regulate the quantity of air to be introduced through the curve, as, if more is introduced than is necessary to complete the combustion, the furnace will be in a measure cooled. If the size of the passage through the pipes I is properly adjusted in a locomotive-boiler for calm weather, and the engine is then run against a head wind, the amount of air thrown into the fire-box through the curve will be too great for the best effect, and to prevent this I apply to the forward end of the boiler a conical air-case, K, from the interior of which the air-pipes I lead, the inlets to which case are so arranged that the supply of air will be but little disturbed by the action of the wind in any direction. I propose to place the inlet at *b*, at the apex of the cone, but small holes in other positions may be used instead of this, or in connection with it, as may be desired.

The cone also serves to reduce the resistance of the air when the engine is running at a high velocity; but the useful result of using the curve within the fire-box will be attained whether the conical chamber K is used or not.

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

1. The combination of the heating curve and its pipe or pipes for receiving air, with the fire-box of the boiler, arranged and operating substantially as described.

2. The combination of the heating-curve and its pipe or pipes for receiving air, with an air-chamber, K, arranged and operating substantially as described.

Executed, May 8, 1868.

JONATHAN AMORY.

Witnesses:

N. C. LOMBARD,

DAVID PRAY.