(No Model.)

J. PRICE.

STEAM BOILER FURNACE.

No. 577,173. Patented Feb. 16, 1897.

Fig. 1.

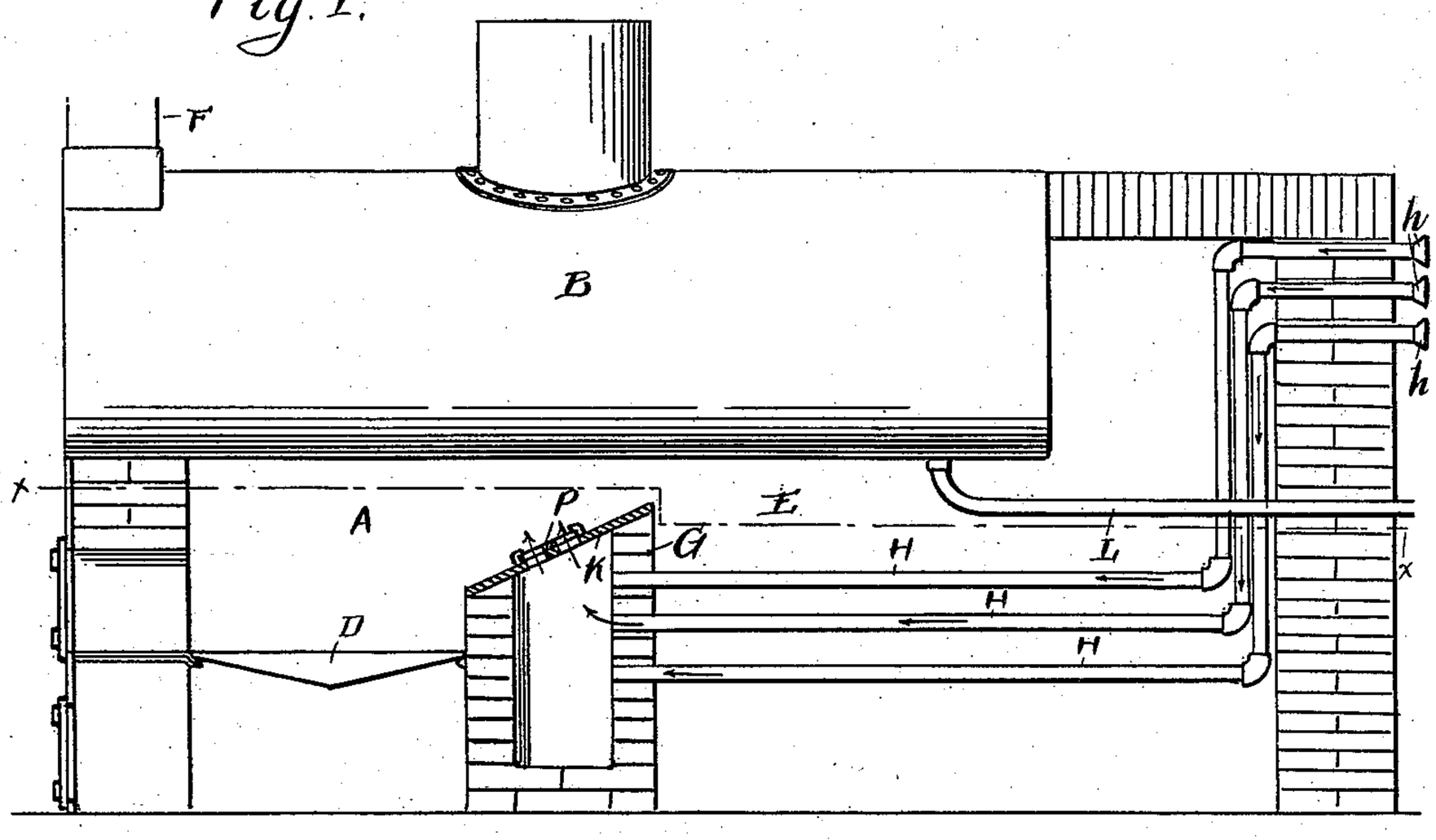
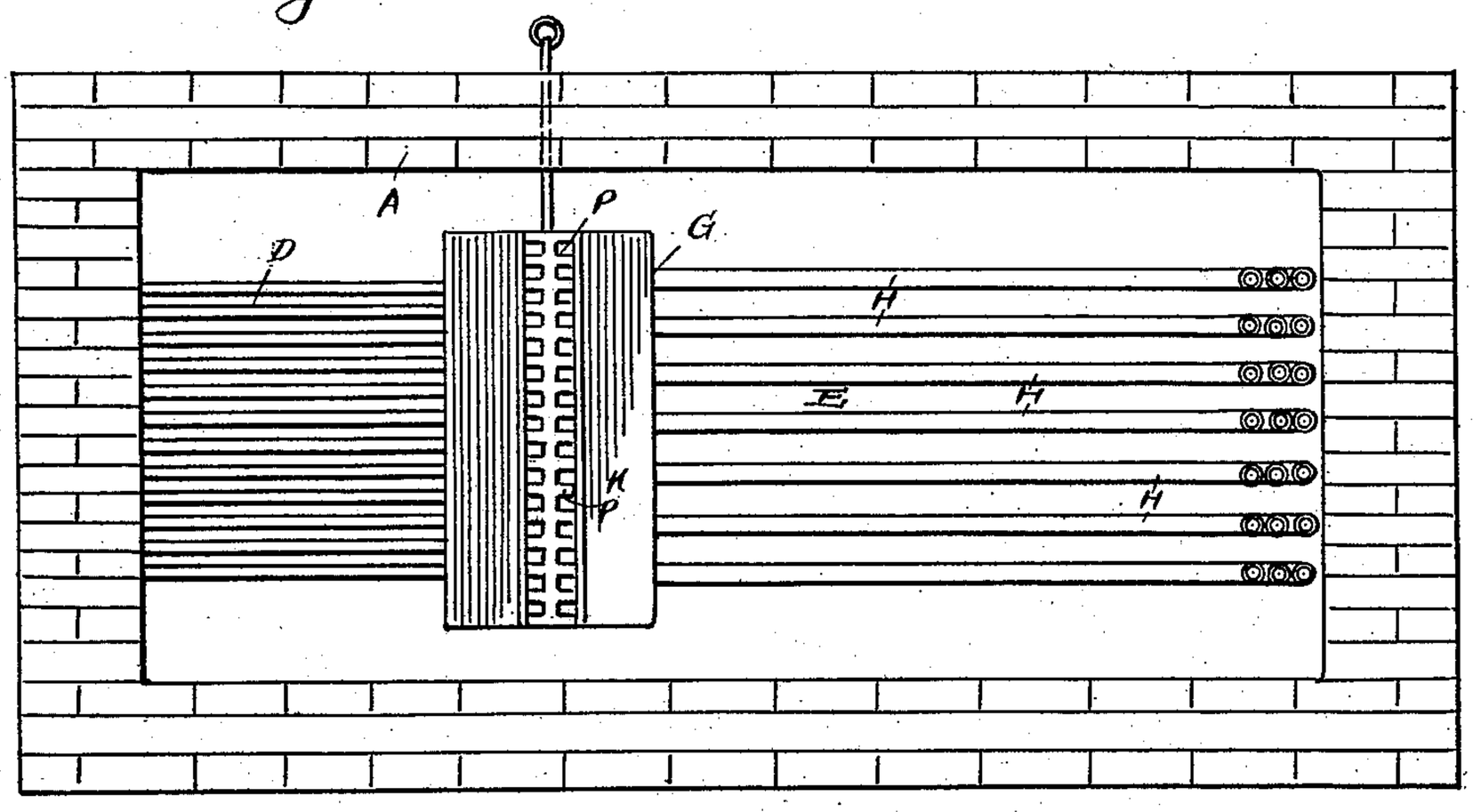


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN PRICE, OF TRENTON, NEW JERSEY.

STEAM-BOILER FURNACE.

SPECIFICATION forming part of Letters Patent No. 577,173, dated February 16, 1897.

Application filed June 8, 1896. Serial No. 594,730. (No model.)

To all whom it may concern:

Be it known that I, JOHN PRICE, a subject of the Queen of Great Britain, and a resident of Trenton, in the county of Mercer and State of New Jersey, have invented certain new and useful Improvements in Steam-Boiler Furnaces; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a vertical central section of the invention; and Fig. 2 is a section of same on line *x x*, Fig. 1.

In my pending application for patent, Serial No. 575,157, I have described and claimed certain new and useful improvements in means for feeding air to steam-boiler furnaces, such improvements consisting in the provision of a vertical flue at the rear of the combustion-chamber and separated therefrom by a vertical partition, said flue communicating with the outer air at its upper end portion, together with a hollow fire-bridge, the chamber of which is connected to the lower portion of said flue by a series of covered horizontal flues, said bridge having in its rear wall, above the flue, an opening through which the heated air discharged by said flue escapes and mingles with the flames and products of combustion which pass over said bridge and underneath the boiler.

The present invention is in some respects an improvement on this arrangement, an object being to do away with the vertical flue and partition at the rear of the combustion-chamber, and in lieu thereof to extend the horizontal flues upwardly through the rear portion of said chamber and through the rear wall thereof to the open air, said flues being directly exposed to the flames and gases in the combustion-chamber substantially their entire length.

A further object is to change the construction of the hollow fire-bridge, into which said flues lead, so as to more effectively mix the heated air from the flues with the flames and products of combustion passing over the bridge.

With these objects in view the invention consists in the novel construction and combination of parts, all as hereinafter described, and pointed out in the appended claim.

Referring to the accompanying drawings, the letter A designates the furnace-wall; B, a boiler supported thereon; C, the ash-pit; D, the fire-grate; and E, the combustion-chamber extending underneath and to the rear of the boiler.

F is the stack.

G is a hollow fire-bridge, and H are the series of flues. These flues extend horizontally from points within the chamber of the fire-bridge to points near the rear wall of the furnace, where they are bent upwardly at right angles through the rear portion of said chamber, and thence outwardly through said wall, terminating, preferably, at their outer ends in bell-mouths *h*. In the drawings I have shown three series of these pipes or flues arranged one above another, each series occupying substantially the full width of the chamber. The pipes of the upper series are but a short distance above the plane of the upper end of the fire-bridge, so that they, as well as those of the other series, are directly subject to the intense heat of the chamber. The interspaces between the pipes are of sufficient dimensions to permit the flames and hot gases to circulate freely therein.

The upper wall K of the fire-bridge is made of a perforated plate, which is inclined as shown, its lower edge being at the side nearest the grate. A sliding damper-plate, such as indicated at P, is preferably employed to regulate the discharge of air through the openings of the plate K.

L is a draw-off for the boiler. The air which enters the pipes or flues begins to be heated as soon as it gets inside the furnace-wall, and is discharged into the chamber of the fire-bridge in a highly-heated condition. The flames and products of combustion from the grate in passing over the inclined wall of the fire-bridge through the somewhat-contracted area of the passage above said bridge receive this heated air under conditions which are

favorable to a very high degree of combustion.

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

In a steam-boiler furnace, the combination with the fire-bridge having an interior chamber, and an upwardly and rearwardly inclined upper wall provided with an air-discharge opening or openings, and means for controlling such opening or openings, of a plurality of air-conducting flues, whose forward ends open into said chamber, said flues having horizontal portions which extend rearwardly through the lower portion of the combustion-chamber, thence vertically through the rear portion of said chamber, thence horizontally out through the rear wall of said chamber, opposite the rear end of the boiler, and terminate in enlarged open ends, said flues being arranged in superposed series extending substantially the width of the combustion-chamber, and separated from each other both individually and serially.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN PRICE.

Witnesses:
THOMAS H. HILL,
PETER W. CROZER.