

(No Model.)

R. L. WALKER.  
FURNACE.

No. 454,310.

Patented June 16, 1891.

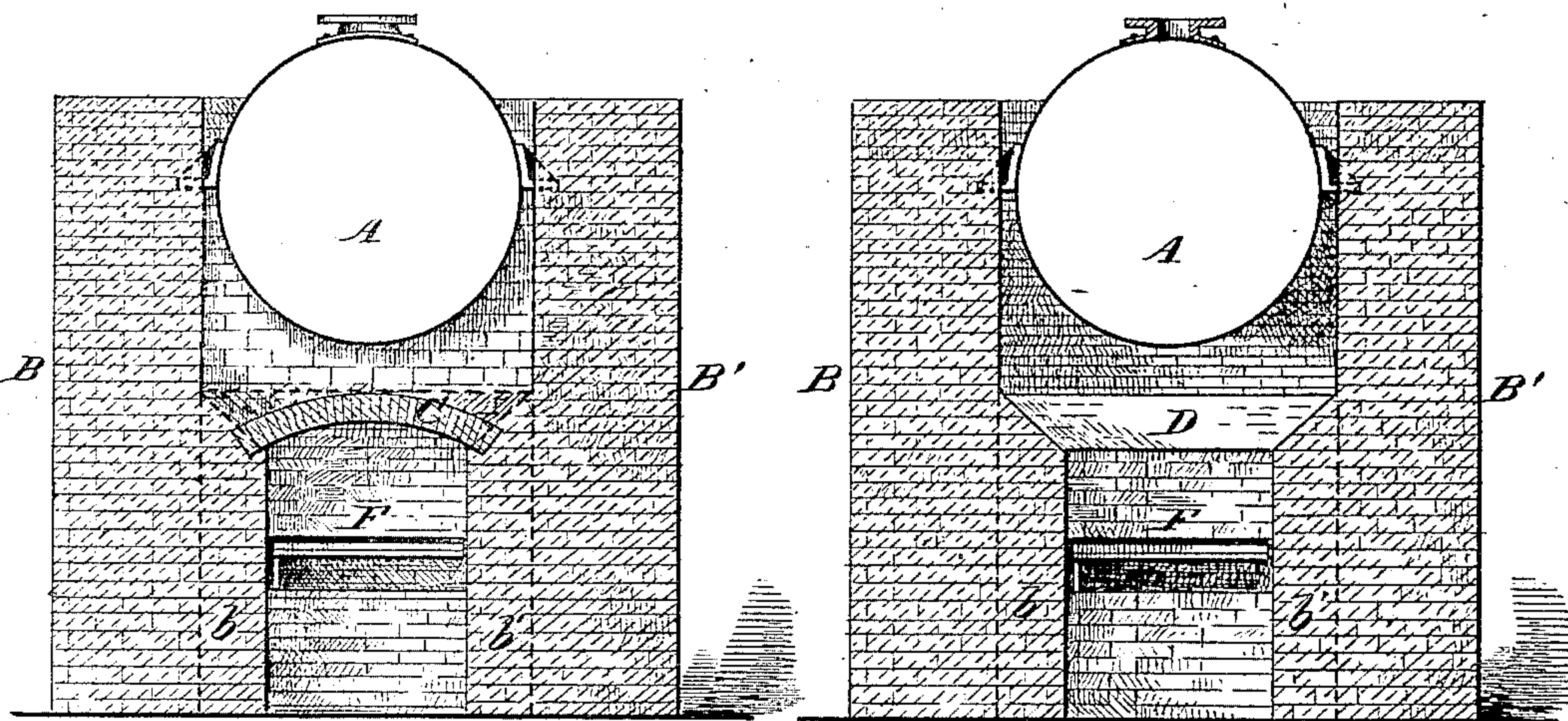
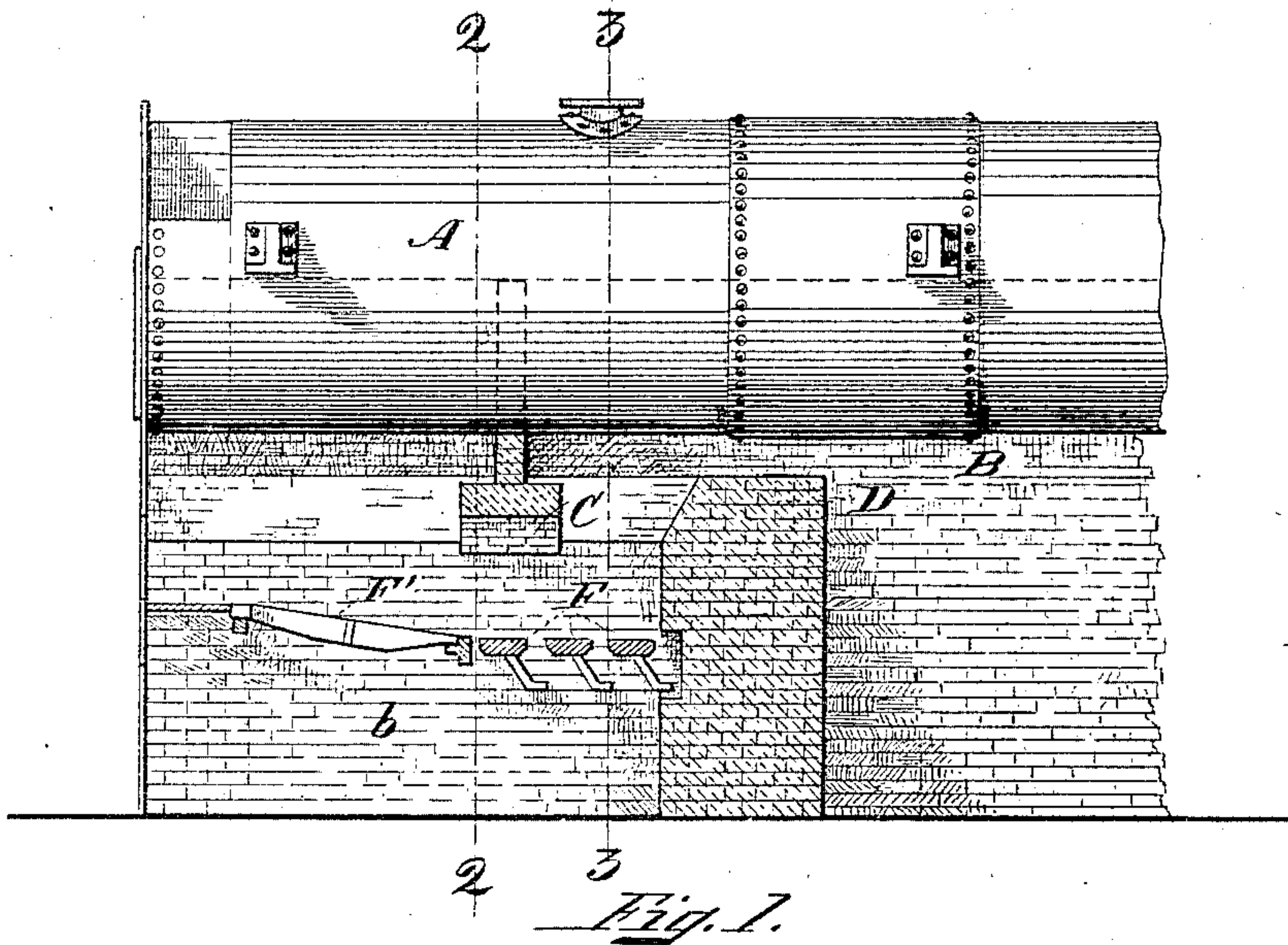


Fig. 2.

Fig. 3.

Witnesses  
James P. Babcock.  
John R. Snow.

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Robert L. Walker  
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# UNITED STATES PATENT OFFICE.

ROBERT LOUDON WALKER, OF BOSTON, MASSACHUSETTS.

## FURNACE.

SPECIFICATION forming part of Letters Patent No. 454,310, dated June 16, 1891.

Application filed February 9, 1891. Serial No. 380,864. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT LOUDON WALKER, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Furnace, of which the following is a specification, reference being had to the accompanying drawings, making a part hereof, in which—

Figure 1 is a longitudinal section; and Figs. 2 and 3 are cross-sections on the corresponding section-lines of Fig. 1, illustrating my invention in its proper form.

My invention relates to that class of furnaces in which the main body of fuel is coking while a smaller body of fuel is incandescent, the products of combustion from the coking fuel being deflected by a hanging wall of fire-brick or like refractory material, which is at a high heat over the incandescent fuel. One example of this class of furnaces is well described in Patent No. 203,666 to Stanton and Hutchinson, dated May 14, 1878; and my invention is an improvement on this class of furnaces, consisting in forming the furnace proper, by which I mean the parts above and below the grates, commonly called the "fire-box" and "ash-pit," with side walls, which are parallel at but diverge above the fuel, as will now be more fully described.

In the drawings, A is the boiler, supported in the usual way between the two main side walls of the brick-work of the furnace. These side walls are marked B B'; but heretofore the fire-box and ash-pit have been formed by the parallel side walls B B', as indicated by the dotted lines in Figs. 2 and 3; and the main feature of my invention is the addition to these side walls of the parts b b' inside those dotted lines, thereby diminishing the width of the fuel-bed, and forming a larger space above the fuel-bed to admit of the expansion of the gases at front and at rear of the hanging wall or deflector C, the gases above the coking fuel, which are the products of the comparatively slow combustion of that fuel mingled with atmospheric air, eddying about in the chamber which is the front portion of the fire-box and passing under the deflector C and over the incandescent or quick-burning fuel in the rear portion of the fire-box, when they again eddy about as they pass over the bridge-wall D on their passage to the stack.

In furnaces of this class the deflector C becomes highly heated, the grate F is a shaking-grate, or such that it is adapted to keep the fuel supported by it open to allow a draft sufficient to keep the fuel incandescent, and the grate F' is of any usual construction, as it supports the slow-burning or coking fuel, as will be well understood without further description; but where the fuel-bed is as wide as any other part of the furnace it is impossible to maintain the proper balance between the coking and the incandescent fuel for the best results, and after a large experience with furnaces of this class I have discovered that the area of the fuel-bed should be considerably less than the area of the furnace in a horizontal plane above the fuel-bed.

In the drawings I have shown the width of the fuel-bed less than the diameter of the boiler, and this is important for the best economy of fuel.

It will now be clear that I do not claim the broad principle of a fuel-bed divided into two parts, nor such a bed combined with a deflector to direct the products from the green or coking fuel upon the incandescent fuel; but that my invention is an improvement upon furnaces of that class, the main feature being the relation of the area of the fuel-bed to the area in a horizontal plane of the chamber which is divided into two parts by the deflector, and the outlet from which is over the bridge-wall, allowing for the expansion of the gases in both chambers, but with a contracted outlet from each chamber, and the diameter of the boiler should always be materially greater than the width of the fuel-bed for the best results with ordinary forms of boiler.

I do not herein claim anything that is shown in my patent, No. 439,706, dated November 4, 1890, my present invention being an improvement on the furnace therein shown, as will be clear if the parts b b' be supposed to be added to that furnace. Nor do I claim anything shown in Patent No. 144,393, to Keyes, dated November 11, 1873, for my invention is not merely the contraction of a fuel-bed, or, what is the same thing, the enlargement of the combustion-chamber above the fuel-bed, but is the combination, with a two-part combustion-chamber, of a two-part fuel-bed, proportioned as explained, whereby the proper balance between

the coking and incandescent fuel is readily maintained, thereby making practical a valuable principle long well known, but heretofore little used because of practical objections  
5 which are wholly obviated by my invention.

What I claim as my invention is—

In combination, boiler A, supporting-walls B B', inner additional walls *b b'*, and bridge-wall D, arranged to form a combustion-chamber, deflector C, dividing that chamber into  
10 two chambers, each with a contracted outlet,

and grates F F', one to support the coking or slow-burning fuel, the other the incandescent fuel, the area of the fuel-bed being materially less than the area of the combustion-chamber in a horizontal plane above the fuel-bed, all  
15 substantially as described.

ROBERT LOUDON WALKER.

Witnesses:

J. E. MAYNADIER,  
JOHN R. SNOW.