(No Model.) 2 Sheets—Sheet 1.

F. BARCLAY.

LOCOMOTIVE OR MARINE BOILER FURNACE.

No. 486,924. Patented Nov. 29, 1892.

Fig. 1.

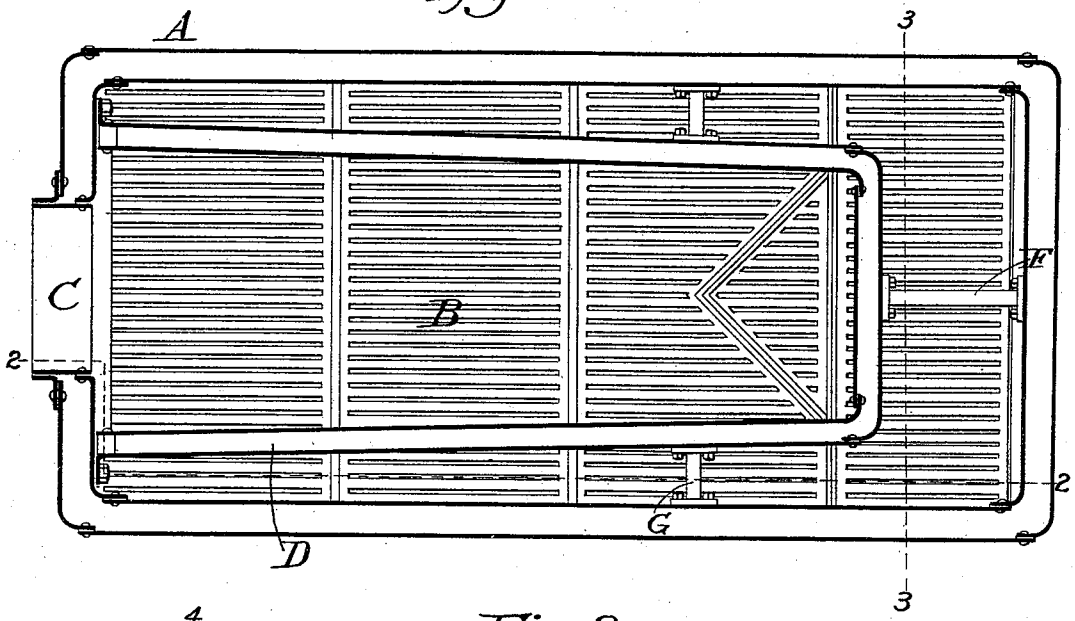
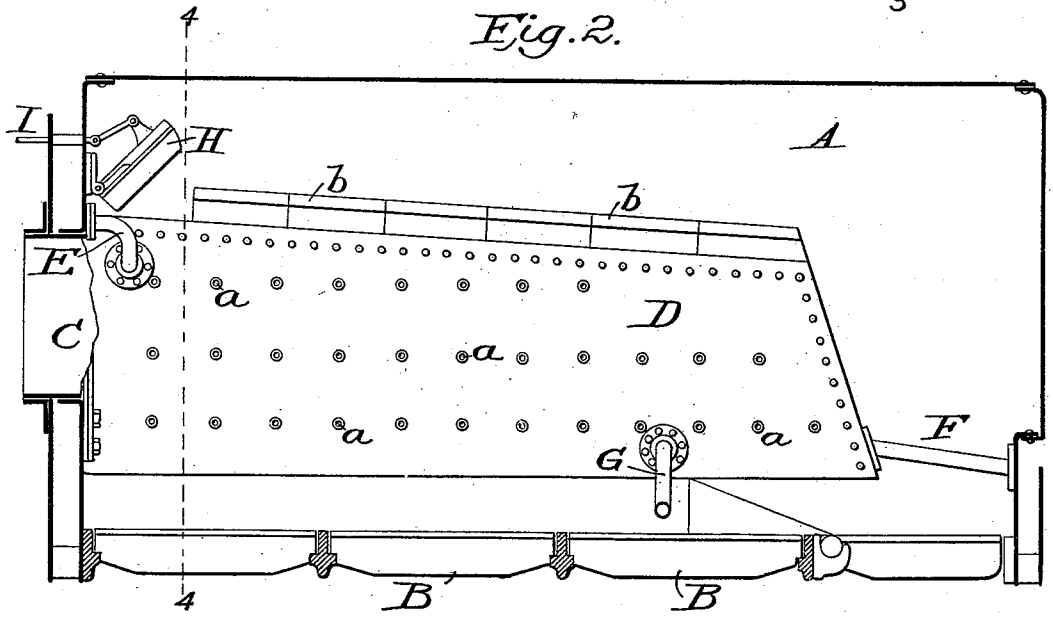


Fig. 2.



Attest:

James F. Duhamel

Horace A. Dodge.

FRANK BARCLAY,

Inventor:

by Dodger Sons

his Attys

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

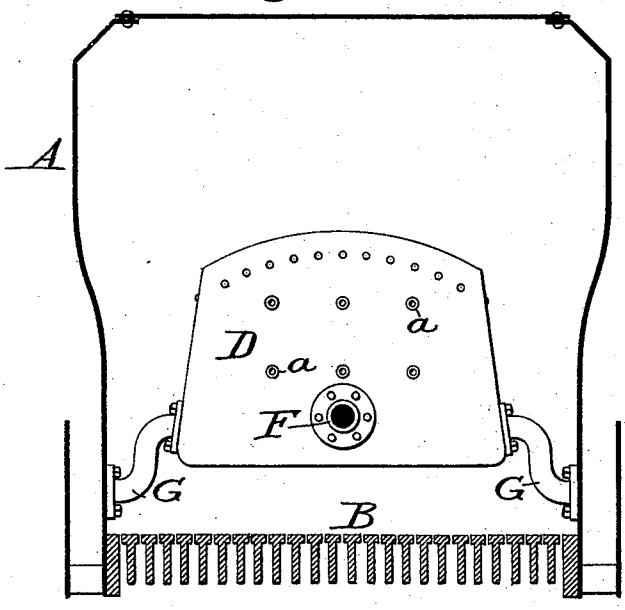
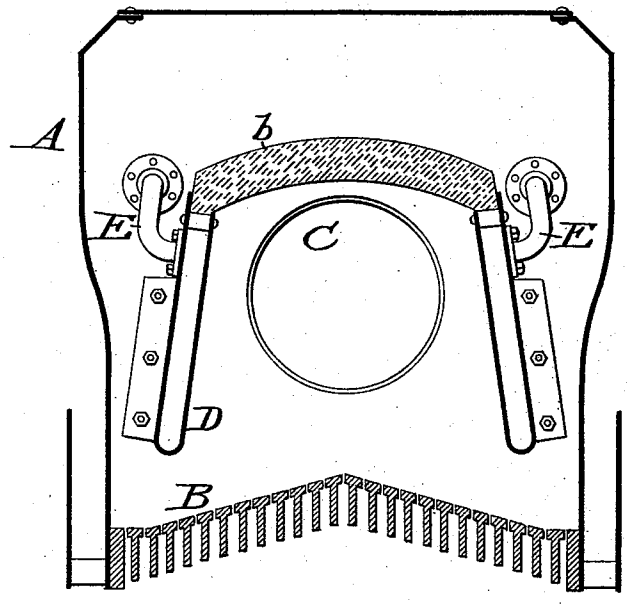


Fig. 4.



Attest:
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Inventor,
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his Attys.

UNITED STATES PATENT OFFICE.

FRANK BARCLAY, OF BEATRICE, NEBRASKA.

LOCOMOTIVE OR MARINE BOILER FURNACE.

SPECIFICATION forming part of Letters Patent No. 486,924, dated November 29, 1892.

Application filed August 23, 1892. Serial No. 443,866. (No model.)

To all whom it may concern:

Be it known that I, FRANK BARCLAY, a citizen of the United States, residing at Beatrice, in the county of Gage and State of Nebraska, have invented certain new and useful Improvements in Locomotive and Marine Boiler Furnaces, of which the following is a specification.

My invention relates to locomotive and marine boiler furnaces; and it consists in various features hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a horizontal sectional view through the fire-box; Fig. 2, a vertical sectional view on the line 2 2 of Fig. 1; Fig. 3, a vertical transverse sectional view on the line 3 3 of Fig. 1, and Fig. 4 a vertical transverse sectional view on the line 4 4 of Fig. 2.

A indicates the fire-box of the locomotive, B the grate, and C the fuel-door at the rear end of the fire-box, the said fire-box being provided with hollow walls, as shown, so as to prevent the sides from burning out and to give increased heating capacity.

D indicates the magazine, which is of substantially ∩ shape in vertical cross-section. This magazine is applied over the fuel door or opening C and is closed on the sides and end, as clearly shown in Fig. 2. The side and end walls of the magazine are made hollow, so as to contain water, the plates forming said side and end walls being connected by tubular bolts *a*, as shown in Fig. 2. This magazine is set up above the grate a slight distance, as shown in Figs. 2, 3, and 4, and is also set away from the inner walls of the fire-box proper, as shown in Figs. 1, 2, and 3, so as to afford a space beneath and at the sides and end of the magazine. The magazine is connected at its rear end with the water-space of the fire-box by curved pipes E, at its forward end by a leg or pipe F, and on its sides near its forward end by curved pipes G, the said pipes E, F, and G serving not only to insure a constant circulation of the water from the magazine to the hollow walls of the fire-box, but also assist in sustaining the magazine in its proper position. The top of the magazine is preferably arched or curved, as shown in Figs. 3 and 4, and is made up of a series of tiles, slabs, or fire-brick *b*, which are supported at their ends upon the side walls of the magazine, as clearly shown in Fig. 4. At the front end of the magazine I arrange a door or direct valve H, which is made by mounting one or more of the tiles, bricks, or slabs upon a hinge, as shown in Fig. 2, so that it may be raised to permit the products of combustion to pass directly into the main part of the fire-box and escape through the flues. This valve H will be operated by means of a rod or handle I, projecting out through the rear wall of the fire-box directly over the fuel-door.

In all similar structures heretofore described, so far as I am aware, the magazine has been so constructed that the hollow walls or water-space surrounded the fuel therein on all sides except at the bottom. With such a construction the heat given off by the fuel is rapidly absorbed and conveyed away by the circulating water therein, and hence the fuel within the magazine cannot be sufficiently heated or coked to expel the gases therefrom to the extent necessary to insure the best results. By making the top of my magazine of fire-brick I remedy this difficulty, as this fire-brick top becomes much more highly heated than the water-filled metallic walls, and therefore much more effectually cokes the fuel within the magazine, thereby more fully expelling the gases therefrom, which gases are compelled to pass through the incandescent fuel which rests upon the grate under the edge of the magazine and outside of the same all around, these highly-heated gases there uniting with the oxygen of the air which enters through the ash-pit and grate and which is also heated, thereby producing a most perfect combustion, and consequently very intense heat. It will of course be understood that the direct-draft door or damper H will be opened only when the fire is first started and that as soon as the fuel is thoroughly ignited this door is to be closed and kept closed, thus compelling the gases to escape from the magazine by passing down and under its lower edge and through the incandescent fuel. It will be apparent that while I have termed the receptacle D a "magazine," it acts as a "retort" and may be appropriately so termed. It is also obvious that by using properly-shaped arch slabs or blocks for the top they may be made to extend down-

ward on the sides as far as desired, the water-space walls being made correspondingly narrower, and that by so doing its coking capacity may be still further increased, the best proportions of these parts being determined by experiment.

Having thus described my invention, what I claim is—

1. As an improvement in locomotive or marine boiler furnaces, a magazine or retort composed in part of hollow walls and in part of fire-brick, said magazine or retort being set or arranged within the fire-box and above the grate, substantially as shown and described.

2. In a locomotive or marine boiler furnace, the combination, with the fire-box, of the magazine or retort composed in part of hollow walls connected by tubes with the boiler and in part of fire-brick or equivalent heat-retaining material and provided with a direct-draft opening and a door or damper for closing the same at will, substantially as and for the purpose set forth.

In witness whereof I hereunto set my hand in the presence of two witnesses.

FRANK BARCLAY.

Witnesses:
S. C. SMITH,
C. E. NORTON.