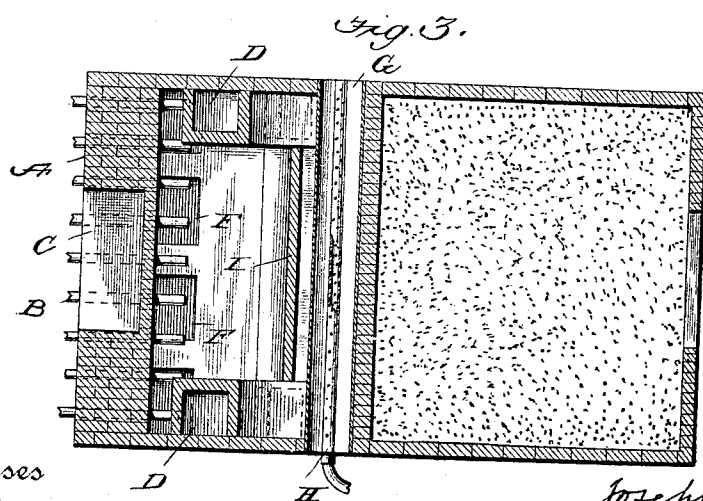
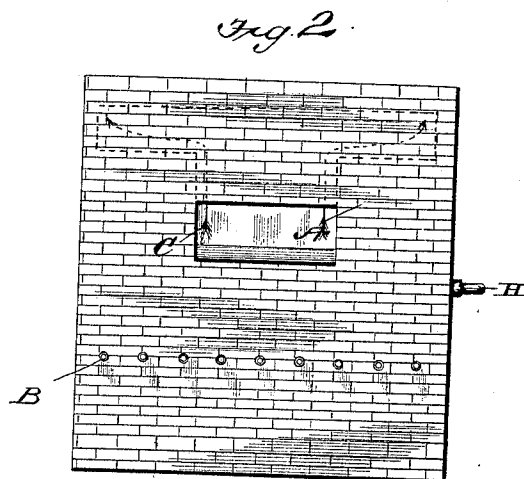
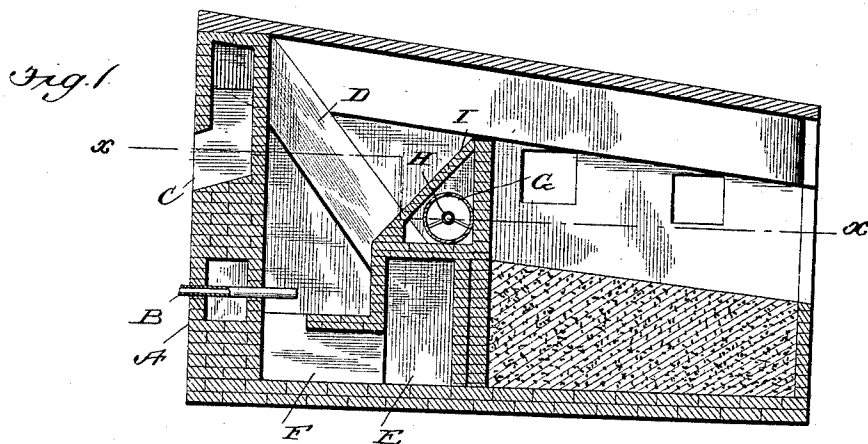


(No Model.)

J. BUTLER.
METALLURGIC FURNACE.

No. 519,985.

Patented May 15, 1894.



Witnesses
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W. E. Clendaniel.

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UNITED STATES PATENT OFFICE.

JOSEPH BUTLER, OF MARION, INDIANA.

METALLURGIC FURNACE.

SPECIFICATION forming part of Letters Patent No. 519,985, dated May 15, 1894.

Application filed December 20, 1893. Serial No. 494,181. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH BUTLER, a citizen of the United States, residing at Marion, in the county of Grant and State of Indiana, have invented certain new and useful Improvements in Metallurgic-Furnaces, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention is designed to provide a furnace for metallurgic purposes, more particularly for those in which gas is used as the fuel, but some parts of my improvement may be used with other kinds of furnaces. The main objects are to save in the first cost of building such furnaces and the expense of maintaining them, and also to save fuel.

To these ends the invention consists in the peculiar construction, arrangement and combinations of parts hereinafter more particularly described and then definitely claimed.

In the accompanying drawings—Figure 1 is a vertical longitudinal section of a furnace constructed according to my improvement. Fig. 2 is a front view of the same. Fig. 3 is a horizontal section on the line *x x* in Fig. 1.

Referring now to the details of the drawings by letters—A represents the front of the furnace through which pass the gas-pipes B to supply the fuel. At C is shown the air inlet through which the air enters and after rising as shown by the arrows in Fig. 2, it passes off to the side passages D in the combustion-chamber down to the distributing-chamber E whence it passes into the branch chambers F, and from thence it rises and mingles with the gas entering through the pipes B, and as it has become thoroughly heated on its passage through the different chambers, it saves a very large amount of gas, as with the air heated in this way much less gas is required.

Above the distributing-chamber E is a metallic pipe or tube G about six inches in diameter which is open at both ends, to admit air freely, thus helping to keep it cool, and inside this is a water-pipe H perforated to spray the inside of the tube G, which may always thus be kept comparatively cool, no matter how great the heat may be above it.

The water after it is sprayed against the upper part of the tube runs down the inside and out at the ends to a sewer or other receptacle. By this construction, the bridge I may be built much more cheaply, as instead of using a solid mass of expensive fire-brick, a bridge-wall of a few inches thickness will be sufficient, for there is no fear of its being burned out, owing to its being kept cool by the air-tube and the water spray on the inside thereof. With the ordinary bridge, the cinder soon eats its way through the fire-brick and chokes up the air-chambers so that there is not sufficient air admitted to keep up the right degree of heat for the proper combustion, but with my arrangement as soon as the cinder strikes the tube it becomes chilled and can then go no farther, by which means the air-chambers are always left clear and free.

What I claim as new is—

1. The combination in a furnace, of the air-passages D, commencing at the front of the furnace and running through the combustion-chamber, the air-distributing chamber E at the rear of said combustion-chamber, and the branch passages F running from the distributing chamber under the combustion-chamber toward the front of the latter, substantially as described.

2. The furnace herein shown, comprising a combustion-chamber, air-passages D commencing at the front of the furnace and running through said combustion-chamber, the air-distributing chamber E, at the rear of said combustion chamber, the branch passages F running from the distributing chamber under the combustion-chamber toward the front of the latter, the air-tube G arranged near the top of the bridge and over the distributing chamber, and a spray-tube H arranged inside the air-tube, all constructed and arranged substantially as shown and described.

In testimony whereof I affix my signature, in presence of two witnesses, this 14th day of December, 1893.

JOSEPH BUTLER.

Witnesses:

G. D. DEAN,
WILL H. TROOK.