T. S. BLAIR.

Converting Iron into Steel.

No. 51,289. Patented Dec. 5, 1865.

Fig. 3.

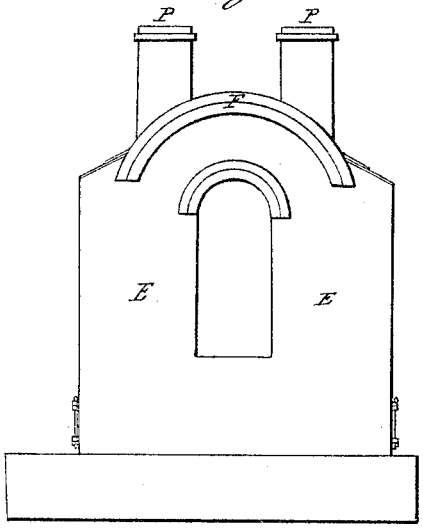


Fig. 4.

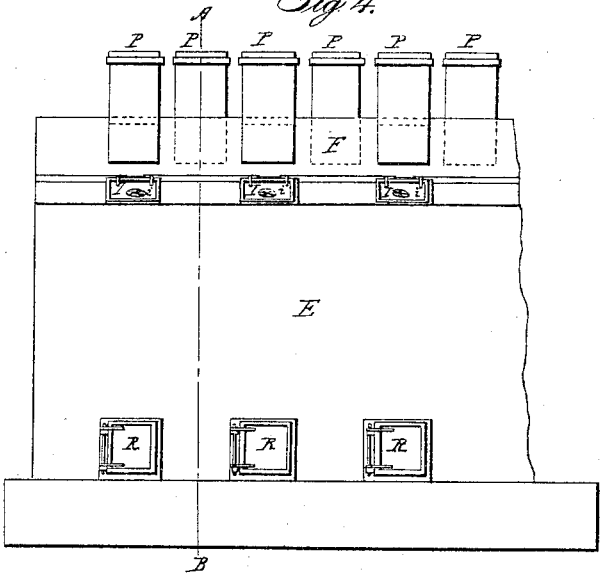


Fig. 1.

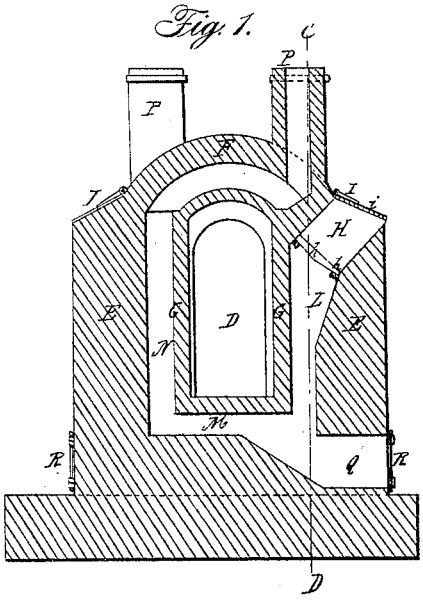
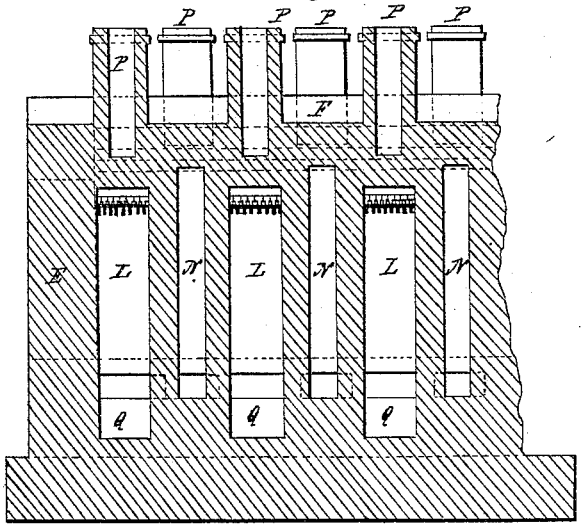


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

THOMAS S. BLAIR, OF PITTSBURG, PENNSYLVANIA.

IMPROVED FURNACE FOR CONVERTING BARS INTO STEEL.

Specification forming part of Letters Patent No. **51,289**, dated December 5, 1865.

To all whom it may concern:

Be it known that I, THOMAS S. BLAIR, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and Improved Converting-Oven, more especially intended for converting into steel rails the ordinary iron railroad-rails; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in a converting-oven provided with a number of fire-boxes and flues so arranged as to allow of a regular and equal degree of heat being applied to all parts of the said oven, thereby obtaining a more perfect and equal effect on the rails through their whole length.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

Figure 1 is a transversal section of the oven through the line A B. Fig. 2 is a longitudinal section of the oven through the line C D. Fig. 3 is an end view of the oven, and Fig. 4 is a side view of the oven.

D is the oven; E, the outside walls, made thick to retain the heat.

F is the arch or vault; *f*, the temporary arch.

G G G are the partition-walls between the fire and the oven.

H H are the fire-boxes.

h h h, &c., are the grate-bars.

I I I are the doors, with air-registers *i i*.

L L L are the descending flues.

M M M are the under-floor flues, and N N N are the ascending flues.

O is the space between the two arches F and *f*.

P P P P, &c., are the smoke-stacks, which will receive dampers, as usual.

Q Q Q are the ash-pits to receive the cinders and dust which passes through the grate-bars *h h*.

R R R are the doors to close the ash-pits Q, and to prevent the admission of air when the furnaces are at work.

It will at once be noticed, by inspecting the drawings, that the construction of my oven is entirely different from all the converting-ovens now in use. In my oven, instead of one long furnace placed near the bottom of the oven and parallel with it running its whole length, I have a number of fire-boxes, H H H H, &c., built near the top of the oven separate and distinct from each other and placed alternately on the right and on the left of the oven. These fire-boxes are provided with grates *h h h*, upon which the fuel rests, and through which the flame passes to descend by the flue L, pass by the flue M, and ascend by the flue N into the open space O and out by the stack P.

As the sides of the oven are provided alternately with a descending flue, L, and an ascending flue, N, and that the heat in the one is greater than in the other, they act by compensation and make one side as hot as the other, thereby obtaining an equal temperature in the whole oven not attainable by the present system of building them.

Operation: The oven D being charged with rails in the ordinary way, the fires are lit in all the fire-boxes H H H, &c., and the registers *i i i* of the doors I I I are left open to admit the air necessary for the combustion of the fuel. The draft of the stacks P P P will create a vacuum in the space O, the flues N N N, the flues M M M, and the flues L L L, which will draw the flame of the fuel through the bars *h h h*.

When new fuel is required it is introduced in the fire-boxes H H H by the doors I I I, and as the fire is already well ignited, and that the smoke from the green fuel has to pass through that fire before it can enter the flue L, all the carbon in the smoke is consumed, augmenting thereby the heat and making a corresponding saving in the fuel.

The cinders falling through the grate *h h* will collect in the ash-pit Q Q, and they can be removed by the door R, which, however, must be kept closed when the furnace is at work.

By this arrangement I am enabled to regulate the heat of every part of the oven; or if one part is too cold I can urge on and make more fire in the fire-box which is opposite to the cold spot; or if one part is too hot I can close the damper or register of the fire-box near

that part of the oven, and thereby obtain a perfect regularity of heat in all the oven and a better effect on the rails.

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

1. The fire-boxes H H H, &c.

2. The flues L L L and the flues N N N, alternately arranged on the sides of the oven.

3. The oven D, heated by fire-boxes H H, &c., and alternate descending and ascending flues, as described, and for the purpose specified.

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Witnesses:

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