

W. F. TAYLOR.
 REGENERATIVE FURNACE.
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1,040,459.

Patented Oct. 8, 1912.

FIG. 1.

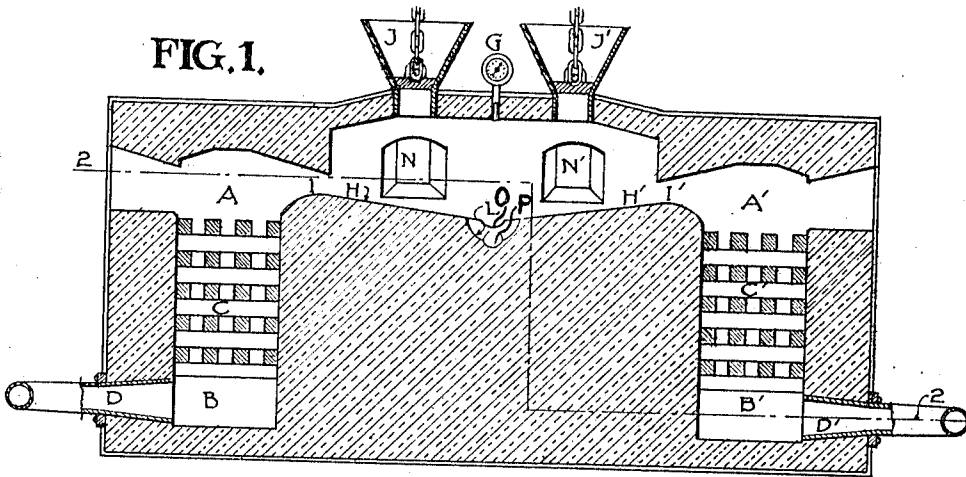


FIG. 2.

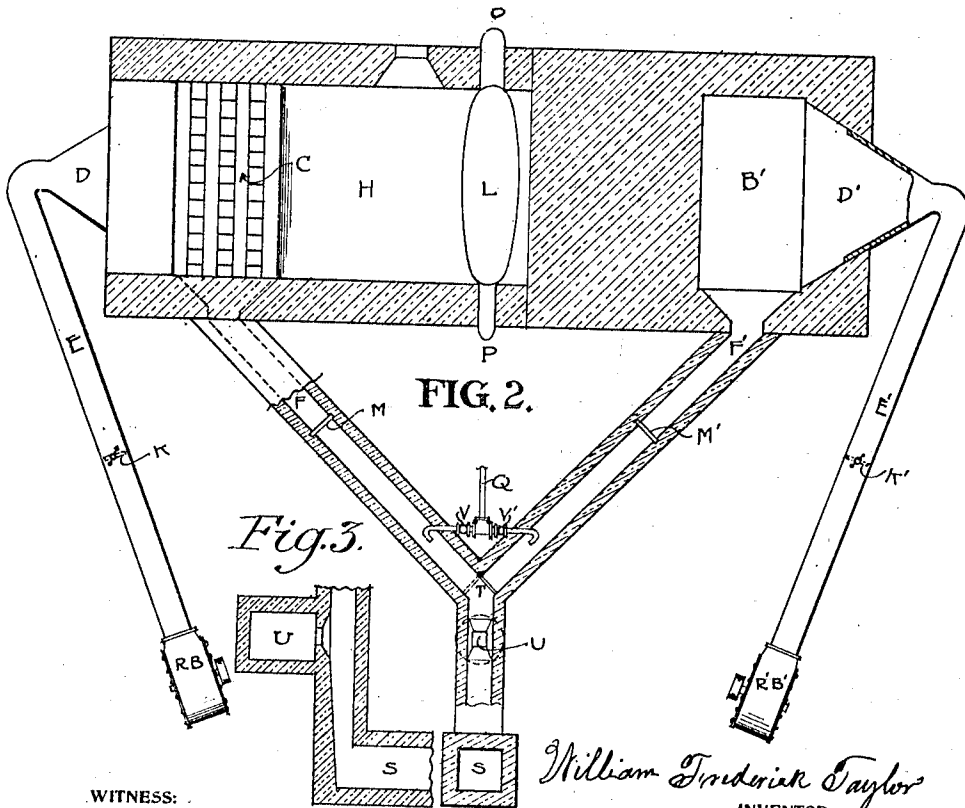


Fig. 3.

WITNESS:
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UNITED STATES PATENT OFFICE.

WILLIAM FREDERICK TAYLOR, OF TACOMA, WASHINGTON.

REGENERATIVE FURNACE.

1,040,459.

Specification of Letters Patent.

Patented Oct. 8, 1912.

Application filed June 12, 1908. Serial No. 438,247.

To all whom it may concern:

Be it known that I, WILLIAM FREDERICK TAYLOR, of the city of Tacoma, in the county of Pierce, State of Washington, have invented certain new and useful Improvements in Regenerative Furnaces, of which the following is a specification of the same.

The objects of my invention are, first, to provide a regenerative furnace that will reduce all kinds of ore to a fine matte by a heat produced within the furnace; and, second, to produce a form of furnace that will produce a smelting heat from wood, coal, charcoal, coke and oil, according to the condition of the locality, as fuels used within the furnace. I attain these objects by means of the form of furnace illustrated in the accompanying drawing in which—

Figure 1 is a vertical section lengthwise through the furnace. Fig. 2 is a plan section on the line 2—2. Fig. 3 is a sectional part of the flue to the smoke stack and contains the condenser.

Similar letters refer to similar parts in the several views.

The fire-boxes or combustion chambers are indicated at A A' and are designed to be used alternately. Each fire-box is located over a chamber of flues C C' or checkerwork, constructed of refractory materials, which open at the bottom into the flues B B', connected with the smoke stack S through the external flues F F', each flue is provided with a damper M M' with which to regulate and alternate the draft. Each fire-box is provided with a forced draft by means of the air flues D D', which open the full width of the bottom into the flues B B' and which are supplied with air from the Root blowers at R B and R' B', through the pipe E E' connected therewith. The force and quantity of air is regulated by the machinery that operates the Root blowers. The heat indicator G shows the desired amount of heat required. Each fire-box is connected with smelting hearths H H' by means of the ports I I'.

The furnace is heated by starting a fire in one of the fire-boxes as A. The dampers M K' being closed and M' K being open. This causes the products of combustion to pass through the smelting chamber over the hearth H H', through the fire-box A' and the flues B' C' and F' to the smoke-stack S. When the furnace and flues become well heated by the products of combustion, a fire

is started in fire-box A' and the dampers reversed, and the fire in A is allowed to go down, when the flues D and C become heated and the furnace is ready for use.

Ore is put in the furnace through the charging hoppers J J', the ore being spread and stirred through the doors N N'. The hearths are designed to be charged alternately, the fresh ore being deposited on the hearth farthest from the fire-box in use, so the ore will be roasted preparatory to being subjected to the intense heat of the nearest fire-box when the fire is alternated to it. The fires thus alternated and the ores exposed to the products of combustion alternately from opposite ends of the furnace, soon become reduced to matte and slag, which readily collects in the lead-well L and is drawn off, the slag at the upper tap hole O, and the bullion at the lower tap hole P.

At Q is located a cold water pipe having outlets designed to discharge alternately into the flues F and F', each outlet being operated by a valve V V'. The spray of cold water discharged from these outlets condenses or precipitates all volatilized metals from the smoke and gases passing through the flue. A receptacle or well U collects these metals and they are thus saved.

With the form of furnace here shown and described it is found that the heated flues and checkerwork so heat the air and aid combustion, that the common fuels, wood, coal, charcoal, coke and oil produce a heat so intense as to reduce the most refractory ores without the aid of gases.

I thus produce a furnace that can be constructed and operated with a small amount of capital and in remote districts.

It is to be understood that I do not confine myself to fixed proportions or dimensions, but, reserve the right to vary the same to secure the best results and as circumstances may require.

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

1. A regenerative furnace comprising hearths and a bullion well, superheating flues containing refractory material located at opposite sides of the hearths, combustion chambers at the top of the superheating flues, flues at the bottom of the superheating flues, externally located flues connecting the flues at the bottom of the superheating flues with a smoke stack, and a forced draft for

each superheating flue and combustion chamber, consisting of flues opening directly into the flues at the bottom of the superheating flues independently of the flues leading from the bottom flue of the superheater flues to the smoke-stack, and means for forcing a regulated supply of air to the flues at the bottom of the superheating flues, substantially as described.

10 2. A regenerative furnace comprising hearths and a bullion well, superheating flues containing refractory material located at opposite sides of the hearths, combustion chambers at the top of the superheating

15 flues, flues at the bottom of the superheating flues, a smoke stack and externally lo-

cated valve controlled flues connecting it with the flues at the bottom of the superheating flues, air flues, independent of the flues communicating with the stack, opening directly into the flue beneath each superheating flue and substantially the width of said flue where it opens therein, and means for creating and supplying a regulated forced air draft through said flue, substantially as described.

Tacoma, Washington, April 18th, 1908.

W. FREDERICK TAYLOR.

Signed in the presence of—

A. M. BAILEY,

G. L. HACKETT.