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T. T. SCOTT

OPEN HEARTH FURNACE

Filed Mar. 28, 1921

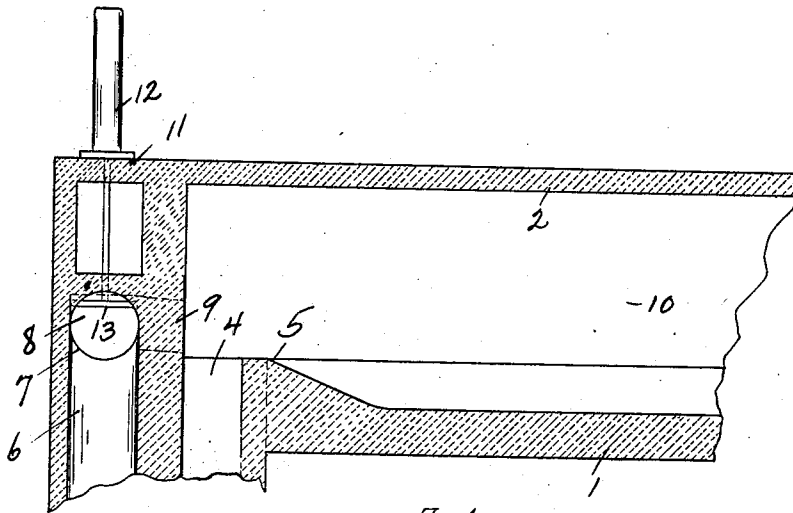


Fig. 1

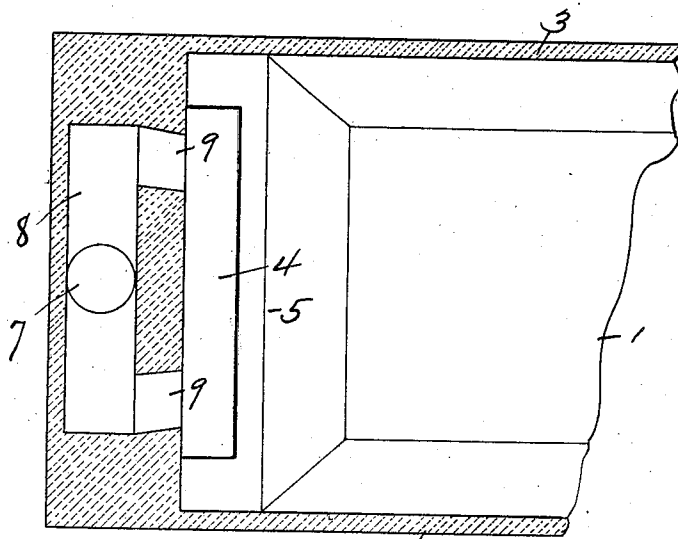


Fig. 2

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OPEN-HEARTH FURNACE.

Application filed March 28, 1921. Serial No. 456,281.

To all whom it may concern:

Be it known that THOMAS T. SCOTT, citizen of the United States of America, residing at New Springfield, in the county of Mahoning and State of Ohio, has invented certain new and useful Improvements in Open-Hearth Furnaces, of which the following is a specification.

This invention relates to regenerating open hearth furnaces. Furnaces of this type, as heretofore used, employ opposite gas nozzles and opposite air passages, the products of combustion, after passing through the hearth chamber, being drawn off through both the air passages, and the gas nozzle. This has resulted in subjecting the mouth of each gas nozzle to the action of the intensely hot outgoing gases with the result that the nozzles have soon broken down, thus rendering the furnace unfit for further use until partly reconstructed. The gas nozzle, also the air passages and the entire end structure of the furnace are subjected to the intensely hot outflowing gases. The air passages are also subjected to these intensely hot gases; in fact, the entire end of the furnace soon breaks down under this intense heat.

One of the objects of the present invention is to provide a regenerating open hearth furnace having means whereby communication between each gas nozzle and the gas chamber communicating therewith, is cut off at the outflow end of the furnace so that the hot product of combustion will pass from the furnace solely to the air outlets.

Another object of the invention is to place the air passage above referred to in such a position as to answer a dual purpose in protecting the end wall and parts in relieving the intense heat produced by the outflow, and to provide what may be called an underfeed air current, which mixes with the incoming gas, thereby carrying the combustion gases nearer the surface of the bath.

Another object of the invention is to provide means for shutting off the gas in the uptake nearer the intake port or nozzle. This method of controlling the gas eliminates the waste which is common in ordinary furnaces where the chambers and checker chambers are left filled with gas, which is a waste because of its being drawn off through the stack when the furnace is reversed.

Another object of the invention is to eliminate a number of troublesome parts, which are continually getting out of order and require expensive labor, as well as time caused by delay in making proper repairs.

Another object of the invention is to provide a furnace of the type described, extremely simple in construction, yet at the same time efficient in operation, economical as well, and built so that its utility is extended away beyond that of furnaces now known to the art.

Another object is to provide a plurality of gas ports or nozzles, positioned in such a way as to approach the maximum efficiency of combustion, at the same time directing the flame through the center of the furnace away from the front and back walls.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts, and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, can be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawing the preferred form of the invention has been shown.

In the drawing:

Figure 1 is a vertical sectional view of the furnace.

Figure 2 is a sectional top plan view of the furnace.

Referring to figures by characters of reference 1 designates the furnace bottom. The roof of the furnace is designated as 2. By referring to Figure 2 it will be seen that 3 designates the front and back walls; all of these constructed along the lines in common usage in the art, and which forms no part of this invention.

The air passage 4 is positioned horizontally at the end of the bank 5 of the bath. This air passage 4 is formed by the use of basic material in the upper portion of the same. By the term basic material it is meant that magnesite brick may be used. The upper portion of the air passage 4 is surfaced with a refractory material such as commonly used in the bottom of the bath.

The air passage 4 is vertical and leads up

directly from reheating chambers such as are provided with checker, etc., thereby eliminating the use of arches and slow and expensive construction.

5 By referring to Figure 1 it will be seen that I have provided gas uptake 6, which leads directly from the producer, thereby eliminating all valves and checker work between the end 7 and the producer. This end
10 7 leads into a horizontal chamber 8. At each end of this horizontal chamber 8, I have provided a port or nozzle 9 positioned so as to direct the inflowing gases, so as to meet near the center of the furnace chamber 10. Positioned at point 11 on top of the
15 roof 2 there is a hydraulic jack 12 used to operate a valve 13. This valve 13 is opened when the gases are led into the furnace for combustion, and closed when the furnace is
20 reversed so that the burnt gases, etc., make their exit through the air passage 4.

While the drawing shows the construction of but one end of the furnace, it is understood that both ends of the furnace are
25 constructed alike.

In operation the control is similar to that of other furnaces known to the art, yet differs in so far as the construction is simplified.

30 In referring to the gas uptake 6 it was pointed out that the chambers providing reheating checkers are eliminated. It is desirable that this chamber provided by eliminating the checkers, as above stated, be utilized as a secondary chamber so that in the
35 event that the primary chamber becomes broken down the same may be shut off and the air emitted through the secondary chamber, thereby doubling the utility of this particular part of the furnace.
40

What I claim is:

1. In a reversible furnace of the class de-

scribed, a hearth chamber, air passages located vertically at the ends of the bath, an immovable bath, a gas uptake leading direct
45 from a producer, a horizontal chamber at the end of said gas uptake, gas ports or nozzles positioned at the ends of said horizontal chamber, said gas ports or nozzles positioned so as to direct the inflowing gas to-
50 ward the center of the furnace chamber above the bath, a means for closing the gas uptake when the furnace is reversed, substantially as described for the purpose set
55 forth.

2. In a reversible furnace of the class described, a hearth chamber, an immovable bath, an air passage parallel to the end of the bath and located in front of the gas ports or nozzles, a gas uptake leading direct
60 from the producer, a horizontal chamber formed at the end of said gas uptake, a plurality of gas ports or nozzles positioned so as to direct gas to the center of the hearth chamber, means for closing a valve at the
65 upper end of the gas uptake, substantially as described for the purpose set forth.

3. In a reversible furnace of the class described, a combination of a gas uptake provided with a horizontal chamber, a plurality
70 of gas ports or nozzles directing the gas towards the center of the hearth chamber, with a vertical air passage located between the end of the bath and the horizontal gas chamber provided with gas ports or nozzles,
75 said air passage feeding air underneath the incoming gas, substantially as described for the purpose set forth.

In testimony whereof I affix my signature.

THOMAS T. SCOTT.

Witnesses:

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ARTHUR P. PATTERSON.