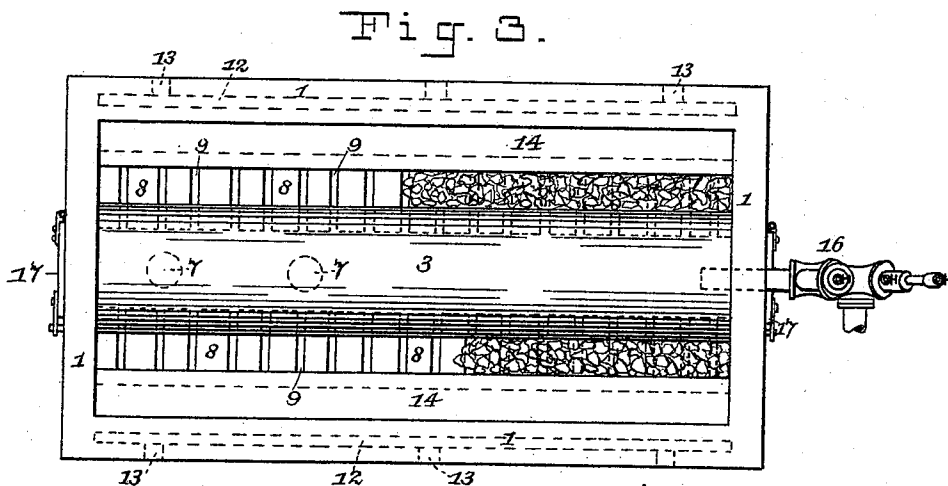
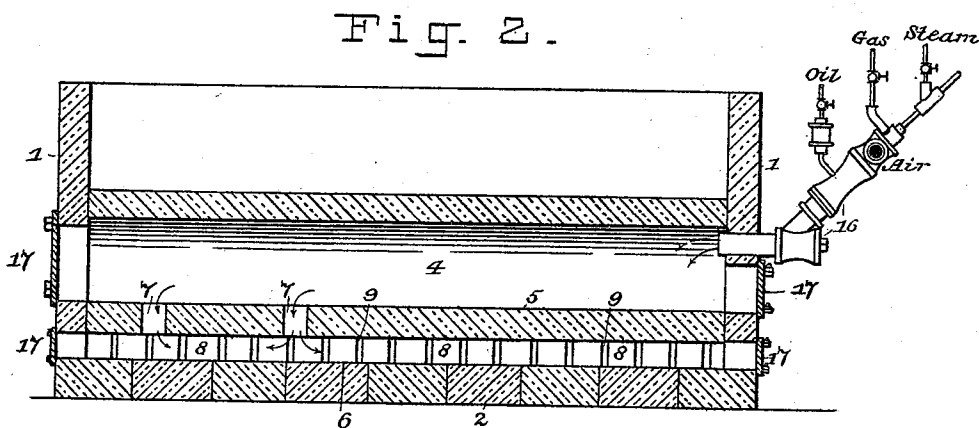
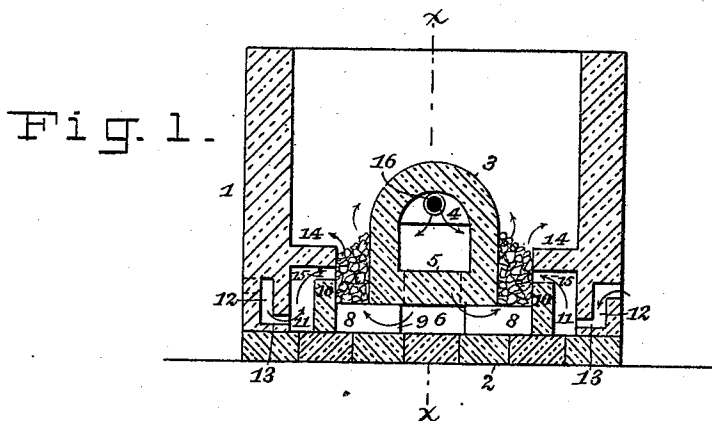


(No Model.)

J. S. ROGERS.
GAS BURNER FOR FURNACES.

No. 496,445.

Patented May 2, 1893.



INVENTOR:

James S. Rogers

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WITNESSES:

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UNITED STATES PATENT OFFICE.

JAMES S. ROGERS, OF SARATOGA SPRINGS, NEW YORK.

GAS-BURNER FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 496,445, dated May 2, 1893.

Application filed April 8, 1892. Serial No. 428,385. (No model.)

To all whom it may concern:

Be it known that I, JAMES S. ROGERS, a citizen of the United States, and a resident of Saratoga Springs, in the county of Saratoga and State of New York, have invented certain new and useful Improvements in Gas-Burners for Furnaces, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention is an improvement on that for which Letters-Patent of the United States were granted to me on the 22d day of March, 1892, Serial No. 471,275, and the object is to produce an improved form of apparatus for burning gas in a furnace for any desired purpose, as in a gas retort furnace, or under a boiler for the generation of steam, or for the purpose of producing a high degree of heat wherever the apparatus is applicable; and for manufacturing the gas to be consumed for the purposes specified, from hydrocarbons, or from the various combinations of hydrocarbons and air, steam, hydrogen and other substances employed for this purpose.

The invention is fully disclosed in the following description of which the accompanying drawings form a part wherein similar numerals of reference, designate like or equivalent parts wherever found throughout the several views, and in which:—

Figure 1, represents a vertical transverse section of a furnace constructed according to my invention: Fig. 2,—a central, longitudinal, vertical section of the same, on the line $x-x$, of Fig. 1; and, Fig. 3,—a top plan view thereof.

In this improvement, not only is the entire burner and all the parts connected therewith composed of fire-brick, or tiles, but the gas retort itself is also composed of the same material, and the entire apparatus is simple and economical in construction, very durable, and can be easily repaired, or entirely renewed, or replaced, at a comparatively low cost, without great loss of time and without interfering with the walls of the furnace proper.

Referring to the drawings, the reference numeral 1, designates the side walls of the furnace, which is provided with the usual brick or tile bottom 2. Arranged within the fur-

nace is the retort 3, which extends the entire length of the furnace and is preferably located centrally thereof. This retort is composed of fire-brick or tile material and may be made of one piece or built up of separate sections, bricks, or tiles joined together in any desired manner. The retort is provided with a central longitudinal chamber 4, and beneath the retort, and separated from the chamber 4, by the bottom 5, of the retort is a gas chamber or passage 6, which is in communication with the chamber 4, of the retort by means of one or more openings or perforations 7, through the bottom of the retort and preferably near the rear end thereof, or the end opposite that at which the gas, hydrocarbon, or other material enters the retort. The side walls of the gas chamber or passage 6, are composed of bricks or tiles 8, having narrow spaces or interstices 9, between them through which the gas from the chamber 6, passes as hereinafter described.

The bricks or tiles 8, extend a predetermined distance beyond the sides of the retort, to walls or partitions 10, which extend above the top of the bricks or tiles 8, forming open topped chambers or receptacles which are filled with broken brick or other refractory material, preferably to a level with, or slightly above the top of the walls or partitions 10. Between the partitions 10, and the side walls of the furnace are air chambers 11, extending the entire length of the furnace, and these air chambers are in communication with, air flues or passages 12, within the walls of the furnace by means of small ducts or perforations 13.

The upper walls of the chambers 11, are composed of bricks or tiles which constitutes a shelf or deflector 14, which extends out from the side walls of the furnace on each side thereof the outer edges thereof being slightly above the top of the partitions 10, thus forming a narrow space or passage 15, which constitutes a communication between the interior of the furnace proper, and the air chamber 11.

In operating this device, I prefer to first introduce within the retort, gas from any desired source, which passes from the retort into the gas chamber 6, thence through the

spaces 9, between the supporting bricks or tiles 8, and the broken brick or other refractory material where it mingles with air entering through the passage 15, and is ignited and burns till the retort and adjacent parts are all highly heated after which hydrocarbons, or gas and hydrocarbons, or either gas or hydrocarbons, or both in combination with steam or water or atmospheric air, if desired, are injected into the retort by means of any device constructed for that purpose, such for example as that designated by the numeral 16, which is shown and described in United States Letters-Patent No. 471,361, granted to me March 22, 1892, where the said substance are rapidly converted into a gas having great heat producing qualities which passes into the gas chamber 6, below the retort, and thence through the interstices or openings 9, up through the broken brick or other refractory material where it mingles with the air from the chambers 11, and is burned along both sides of the retort. This process is continued as long as the furnace is in operation. The broken brick or other material serves not only to thoroughly distribute the gas along the sides of the retort, but also aids in heating the same by which a more perfect combustion is obtained. I have shown doors 17, at each end of the retort and gas chamber, through which, or similar means, access may be had thereto for the purpose of cleaning the same whenever necessary.

It is evident that fixed gas may be used separately, or in combination, in this furnace if desired, or that the process, of manufacturing the gas consumed, from the substances herein referred to, may be followed, and if necessary, that other means than gas may be employed for producing the initial heating of the retort when it is not desired to use gas for that purpose.

It will be readily seen that the bricks or tiles 8, serve simply as a support for the retort, and side walls for the gas chamber 6, through which by means of the interstices or openings 9, the gas from the chamber 6, passes to the point of ignition. Many other forms of construction may be employed for this purpose, all that is necessary, in this connection, being that these side walls for the gas chamber and supports for the retort be provided with perforations or openings through which the gas may pass on its way to the point of ignition.

The air flues 12, serve only as regulators and means for heating the air before combustion takes place and may be omitted, and many other changes in the construction, location and arrangement of the various elements of this apparatus, as shown and described, may be made without materially departing from the scope of my invention as hereinafter claimed, and I do not limit myself to the exact form of construction herein set out but have fully described my inven-

tion, its construction and operation, in the form preferred by me.

I claim and desire to secure by Letters Patent the following:

1. The combination in a furnace, of a gas generator and burner, consisting of a retort, a gas chamber below the retort in communication therewith and supporting the retort, the bottom of the retort forming the top of the gas chamber and the side walls of the gas chamber being provided with gas passages which discharge upwardly along the sides of the retort; air chambers located in the furnace walls and means for discharging the air and mingling it with the gas along the sides of the retort, substantially as shown and described.

2. The combination in a furnace, of a retort, a gas chamber below the retort in communication therewith and separated therefrom by the bottom wall of the retort, the side walls of the gas chamber being provided with passages extending out through the said walls and discharging upwardly along the side walls of the retort, and broken refractory material over the discharge openings of said passages whereby provision is made for decomposing hydrocarbon in the retort and maintaining a high degree of heat in the gas chamber and retort, substantially as described.

3. The combination with a retort, of a gas chamber below the retort in communication therewith and separated therefrom by the bottom wall of the retort, passages leading from the gas chamber and discharging upwardly along the side walls of the retort, broken refractory material over the discharge openings of said passages, partitions forming outer walls of the said passages and for supporting the broken material on the side opposite the retort and means for admitting air through said partitions, substantially as and for the purposes set forth.

4. In a gas generator and burner composed of tiles or bricks, the combination with a retort, of a gas chamber below the same and communicating therewith, said chamber having side walls provided with outwardly extending and upwardly discharging passages, the said retort resting on and supported by the parts forming said side walls and passages, broken refractory material over the discharge openings of said passages and a partition forming the outer wall of said passages and supporting the refractory material against the retort and air inlets in said partitions, substantially as described.

5. The combination with a retort within a furnace, of a gas chamber below the retort and in communication therewith, broken bricks or other refractory material arranged along the sides of the retort, into and through which the gas from the gas chamber passes by means of openings in the walls thereof, and air chambers along the sides of the furnace and adjacent to the broken brick or

other refractory material, from which air passes and mingles with the gas, substantially as shown and described.

5 6. The combination of a retort, a gas chamber below the same and in communication therewith, broken brick or other refractory material arranged along the sides of the retort, means for discharging the gas from the gas chamber through the broken brick or
10 other refractory material and, air chambers adjacent to said broken brick or other refrac-

tory material and means for discharging the air from said chambers and mingling it with the gas, substantially as shown and described.

Signed at New York city, in the county of 15
New York and State of New York, this 5th
day of April, A. D. 1892.

JAMES S. ROGERS.

Witnesses:

L. E. CARMAN,
CHAS. WIRTH.