

(No Model.)

J. S. ROGERS.
GAS BURNER FOR FURNACES.

No. 471,275.

Patented Mar. 22, 1892.

Fig. 1.

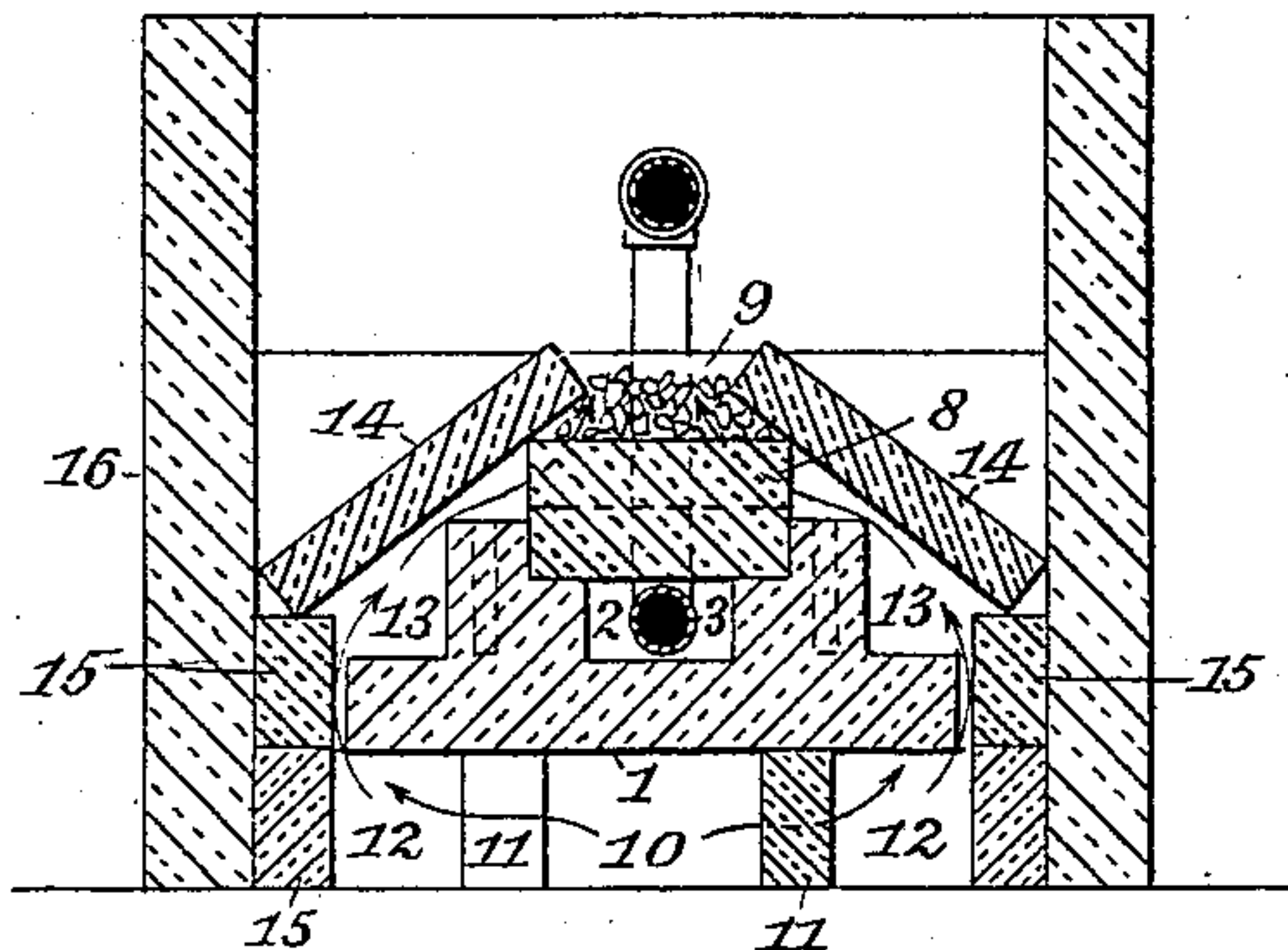


Fig. 4.

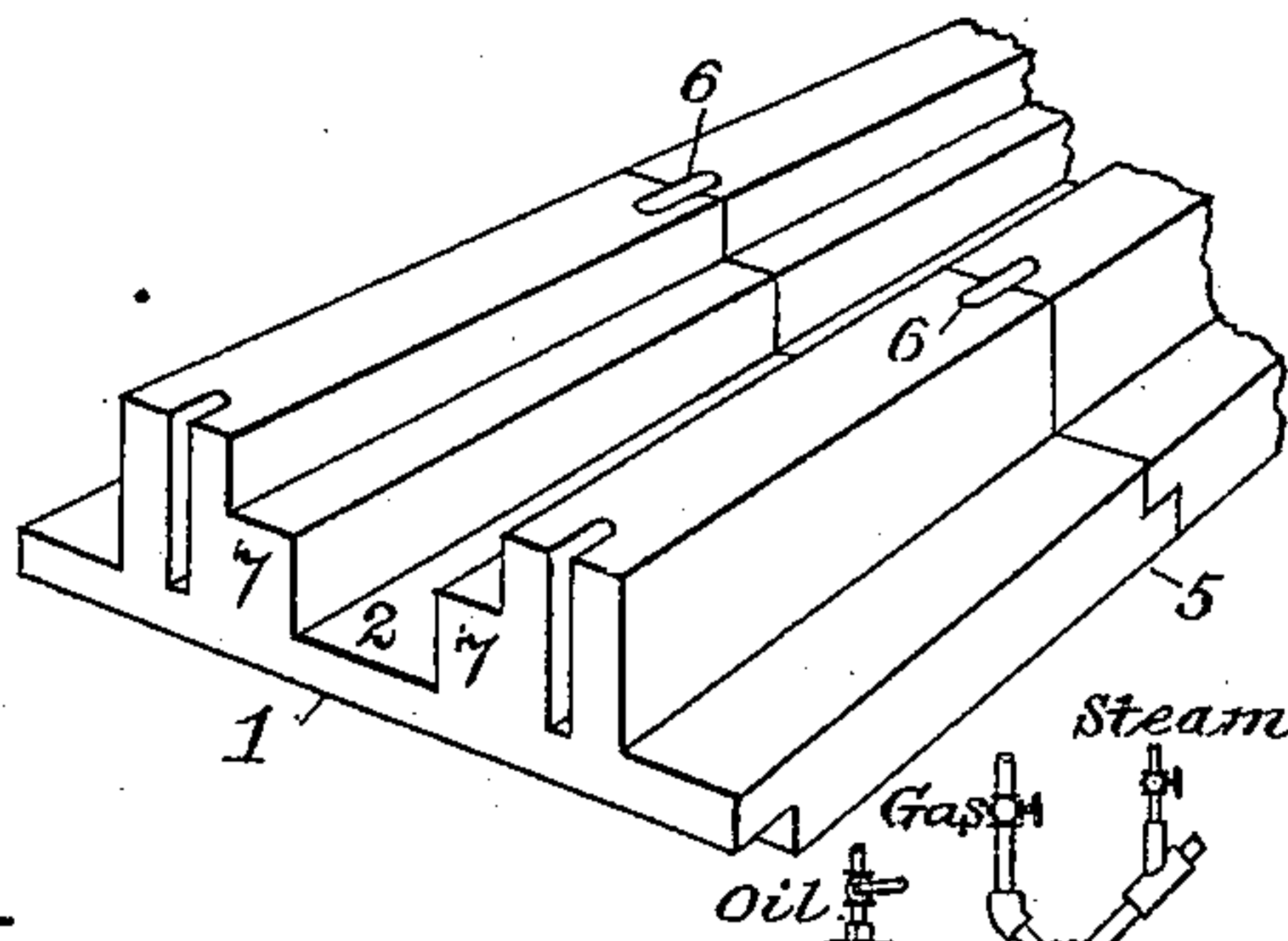


Fig. 2.

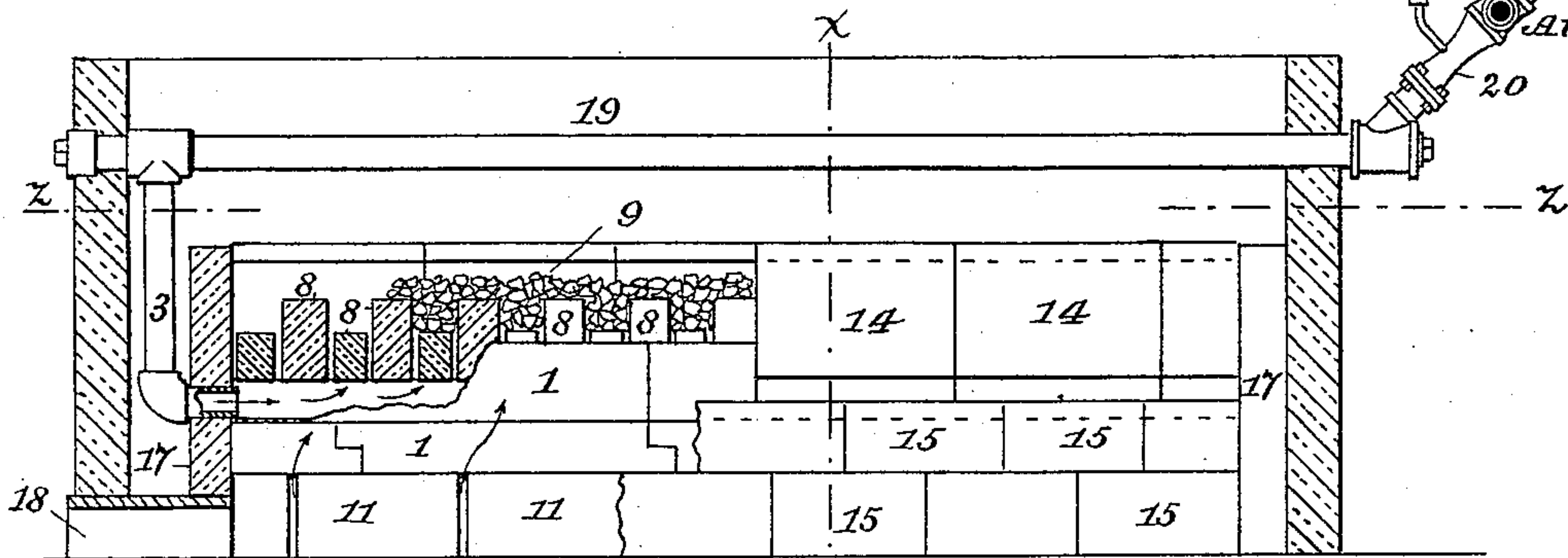
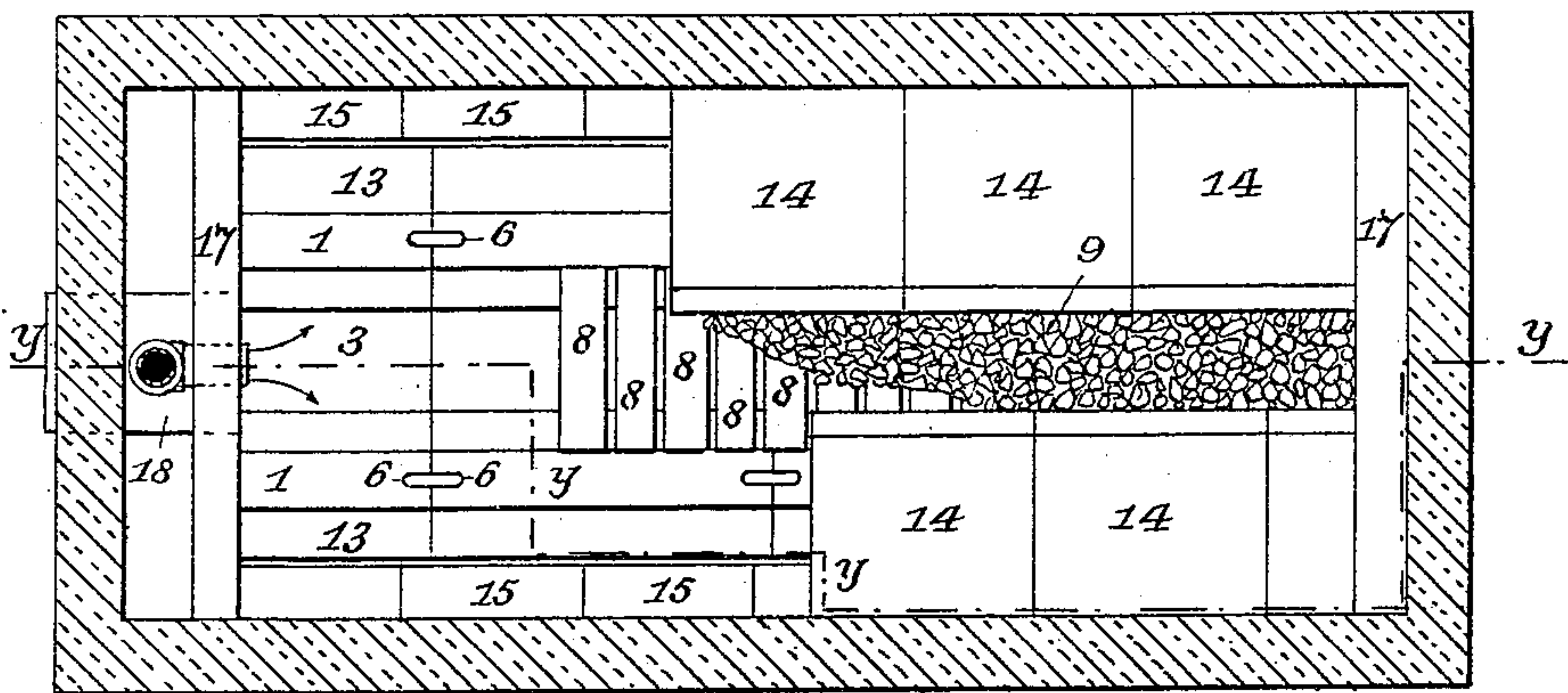


Fig. 3.



WITNESSES:

E. B. Bolton
C. L. Davis

INVENTOR:

James S. Rogers

By *Marble Maron Canfield,*

his Attorneys.

UNITED STATES PATENT OFFICE.

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

GAS-BURNER FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 471,275, dated March 22, 1892.

Application filed January 26, 1891. Serial No. 379,031. (No model.)

To all whom it may concern:

Be it known that I, JAMES S. ROGERS, a citizen of the United States, residing at Saratoga Springs, in the county of Saratoga and State of New York, have invented certain new and useful Improvements in Gas-Burners for Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part hereof.

This invention consists of an improved 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.

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

Figure 1 represents a central vertical section of my improved apparatus for burning gas in a furnace on the line xx of Fig. 2; Fig. 2, a longitudinal vertical section on the line yy of Fig. 3; Fig. 3, a top plan view on the line zz of Fig. 2, and Fig. 4 a perspective view of the body or box portion of the burner proper.

My improved gas-burner for furnaces is composed entirely of fire-brick or tiles, is simple and economical in construction, is very durable, and can be easily repaired or entirely renewed or replaced by a new one at a comparatively low cost and without great loss of time.

Referring to the drawings, the numeral 1 designates the burner body or box, which is provided with a central longitudinal opening or passage 2, which extends the entire length of the burner or furnace and receives the gas from a pipe 3 or any preferred source of supply. This burner-box is composed of separate sections or tiles, as shown in Fig. 4, and is preferably of the shape in cross-section shown in said figure and in Fig. 1, and the separate sections or tiles are united in the manner shown at 5 in Fig. 4, one of said sec-

tions being provided with an offset and the other with an overlapping shoulder, and each with slots 6 in the abutting vertical portions, in which are placed closely-fitting plugs, the object of this construction being to prevent leakage of gas through the joints and to compel the entire volume thereof to pass upward through the burner proper, as hereinafter described. The central opening or passage of this box is expanded near the top, forming shoulders 7, which also extend the entire length of the burner-body, and upon these shoulders 7, extending across the passage and forming a cover therefor, are placed bricks or tiles 8, preferably placed on edge and slightly separated from one another, as shown in Figs. 2 and 3. These bricks are preferably made in two sizes and are placed high and low alternately, and in order to secure a more uniform distribution of the gas, which passes up between them, broken brick or other refractory material can be placed on top thereof, as shown at 9 in Figs. 1, 2, and 3.

The air-flue for conducting air to the combustion-chamber also extends the entire length of the burner-box directly beneath it and is formed by supporting-walls 11, consisting of separate tiles or bricks separated slightly from one another, as shown in Fig. 2, and through the interstices thus left the air passes, as shown by the arrows, into the chambers 12, which extend parallel with the air-flue 10 on both sides thereof, and thence around the bottom of the burner box or tile 1 into the chamber or flue 13, the top of which flue is composed of deflecting plates or tiles 14, which are supported at the bottom by other tiles or bricks 15 and at the top by the edges of the bricks or tiles 8, being kept from slipping laterally by the side walls of the furnace. The air impinging upon the deflecting plates or tiles 14 is highly heated by contact therewith, and passing through the interstices between the bricks or tiles 8 mingles freely with the gas passing upward there-through from the gas-flue or burner-box 2. The fact that these brick or tiles 8 are of different heights and that broken brick or other refractory material is placed upon the same also materially assists in uniformly distributing the gas and mingling the air therewith. The deflector tiles or bricks 14, arranged along

the side walls 16 of the furnace, and the inner ends thereof are supported in an inclined position by the highest of the bricks or tiles 8, which form the cover for the gas opening or passage 2, in such a manner as to form an air chamber or passage between the body or box portion of the burner and the deflector or deflecting plates 14, and the burner-box, as will be seen by Fig. 1, is supported by the bricks or tiles 11 in such a manner as to leave a small space or passage at each side for the air on its way from the flue 10 and chambers 12 to the passage or flue 13 and burner proper, as is shown by the arrows in Figs. 1 and 2.

The ends of the air-flue 10, chambers 12, and passage or flue 13 are preferably closed by walls 17, which also assist in retaining in position the separate portions of the entire device, and air is admitted to the flue 10 in any desired manner, preferably by an opening through the end wall of the furnace at one end thereof in the usual manner, as shown at 18 in Fig. 2.

It is evident that gas may be supplied to the central opening or passage 2 from any desired source; but I prefer to employ, in connection with the burner described herein, the gas-generator described in my application for United States Letters Patent, Serial No. 377,991, filed January 16, 1891, which is shown in Fig. 2. This device consists of a retort-pipe 19, arranged above the burner and in communication with a mixer or fuel-supply 20, designed for injecting gas into the retort for the purpose of starting the fire, and so constructed that after the retort becomes heated the gas may be turned off and oil, oil and steam, oil and air, or oil, steam, and air may be injected into the retort, where a gas having great heat-producing qualities will be formed and conducted by the pipe 3 to the burner; or, if desired, gas alone or gas mingled with any or all of the aforesaid ingredients may be employed. This feature does not, however, form any part of the invention claimed herein, and a more complete description thereof is not deemed necessary.

It is evident that many changes in the construction, combination, and arrangement of parts of my improved burner may be made without departing from the scope of my invention. The broken brick or refractory material placed upon the tiles or bricks 8 may be omitted and very good results produced, the shape or form of the burner and the various parts or elements thereof may be materially modified and any desired number of burners may be placed in a single furnace, and many other changes in the construction, adaptation, and arrangement of the device may be made without avoiding the principle of construction and mode of operation.

Having thus fully described my invention, its construction and operation, I claim, and

desire to secure by Letters Patent, the following, viz:

1. In a brick or tile gas-burner for furnaces, having a longitudinal opening or passage for gas, the combination of a covering for such passage, consisting of bricks or tiles, as 8, having small interstices between the same, an air-flue below the passage for gas, and a deflector plate or plates, as 14, whereby the air from such flue is directed to the top of the burner and mingled with the gas at the point of ignition, substantially as shown and described.

2. A brick or tile burner for furnaces, having a longitudinal opening or passage for gas, a covering for such passage, consisting of bricks or tiles, as 8, having interstices between the same, broken brick or other refractory material placed upon said bricks or tiles, an air-flue below the gas-passage, and deflecting tiles, bricks, or plates, as 14, whereby the air from such flue is directed to the top of the burner and mingled with the gas at the point of ignition, substantially as shown and described.

3. A brick or tile gas-burner for furnaces, having a longitudinal opening or passage for gas, a covering for such passage, consisting of bricks or tiles, as 8, arranged alternately high and low, with small interstices between them, an air-flue below the gas-passage, and deflecting tiles, bricks, or plates, as 14, whereby the air from such flue is directed to the top of the burner and mingled with the gas at the point of ignition, substantially as shown and described.

4. A brick or tile gas-burner for furnaces, having a longitudinal opening or passage for gas, an air-flue below the same, air-chambers in communication therewith and with the top of the burner by means of spaces at each side of the walls of the gas-passage, bricks or tiles covering such gas-passage and having interstices between the same, and deflecting tiles or plates whereby the air from the air-chambers is caused to pass close to the sides of the burner and mingle with the gas at the point of ignition, substantially as shown and described.

5. A brick or tile gas-burner for furnaces, having a longitudinal opening or passage for gas covered by bricks or tiles having small interstices or openings between them, air-flues on either side of the passage for gas, and deflecting plates or tiles covering said air-flues, by which the air therein is directed to the top of the burner and mingled with the gas at the point of ignition, substantially as shown and described.

Signed at the city and county of New York, in the State of New York, this 23d day of January, A. D. 1891.

JAMES S. ROGERS.

Witnesses:

GEO. STOLL,
C. L. DAVIS.