No. 735,337. PATENTED AUG. 4, 1903.

W. H. BRADLEY.

APPARATUS FOR BURNING FUEL GAS.

APPLICATION FILED JUNE 24, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

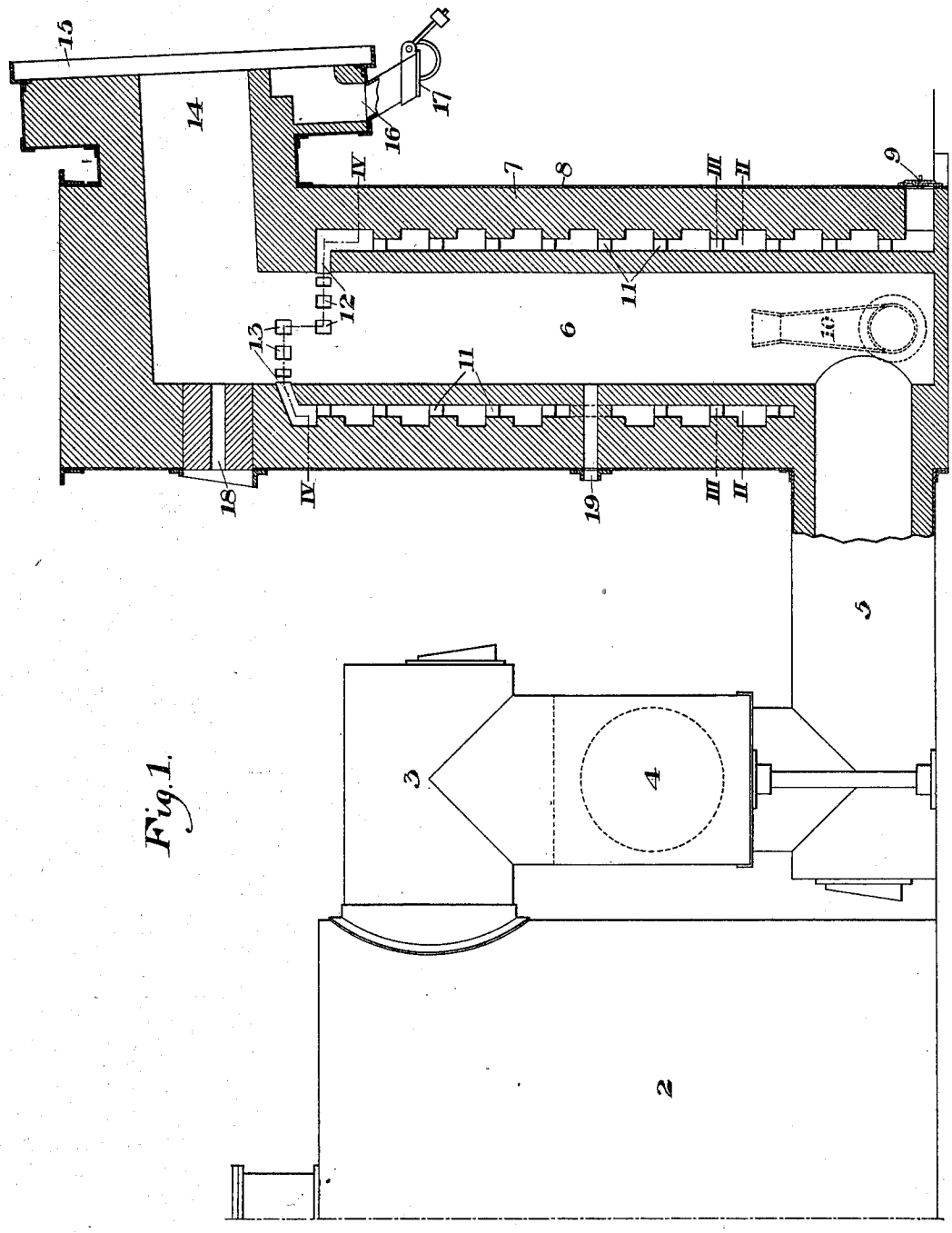


Fig. 1.

WITNESSES

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 4.

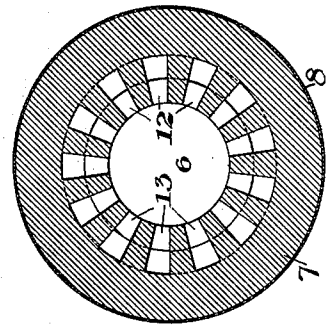


Fig. 3.

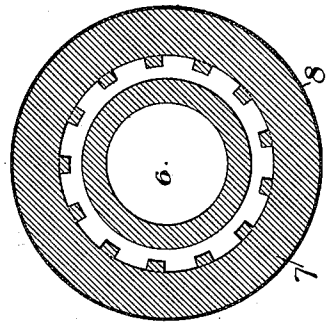
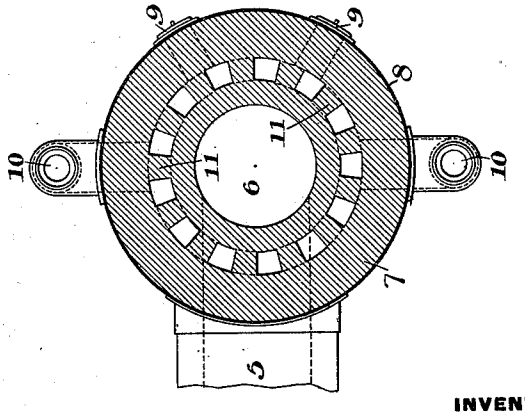


Fig. 2.



WITNESSES

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No. 735,337. Patented August 4, 1903.

UNITED STATES PATENT OFFICE.

WILLIAM H. BRADLEY, OF BELLEVUE, PENNSYLVANIA.

APPARATUS FOR BURNING FUEL-GAS.

SPECIFICATION forming part of Letters Patent No. 735,337, dated August 4, 1903.

Application filed June 24, 1902. Serial No. 112,950. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. BRADLEY, of Bellevue, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Apparatus for Burning Fuel-Gas, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional side elevation showing my improved gas-burning apparatus connected to a gas-producer and rotary kiln; and Figs. 2, 3, and 4 are cross-sections of the burner on the lines II II, III III, and IV IV, respectively, of Fig. 1.

My invention relates to the burning of fuel-gas, and is designed to provide an improved mixer and burner by which an intense heat may be obtained and by which air may be heated by radiation from hot gas supplied from the producer, this air being supplied to and mixed with the gas at the point of combustion.

In the drawings, 2 represents a portion of a gas-producer having a valved off-take 3, having a valved side flue 4, through which the gas passes to the horizontal flue 5. The flue 5 leads into the lower end of a flue 6, which may be arranged at any angle to the flue 5 or may constitute simply a straight extension of the flue 5 in the same line therewith. In the form shown the flue 6 depends vertically and is provided with a surrounding wall 7 of refractory brick, having an outer metallic shell 8. The wall 7 is spaced apart from the central gas-flue to provide an annular air-heating space which is provided at its lower end with air-inlets 9. I have shown two of these inlets at different points around the circumference, the air being forced in by an injector or blower through pipes 10 or the air may be draw in by the natural draft in the annular air-heating flue. The wall 7 is spaced apart from the flue 6 by a system of headers or spacing-bricks 11, thus holding the concentric walls in proper relative position, and the annular air-heating chamber is provided with ports 12 and 13 at its upper end to supply the heated air to the current of hot gas. The ports 13 which enter on the side opposite to the combustion-chamber 14 are preferably inclined and directed toward the combustion-chamber. This is an important feature, as the inclination of the ports causes the air to exert a suction upon the gas and draw it from the producer. This also serves to direct the flame in the proper direction and reduces the cutting action upon the brickwork.

In the form shown, 15 is the end portion of a rotary kiln having an outlet 16, provided with a counterweighted door 17.

18 is a peep-hole for inspection of the kiln, and 19 is an air-inlet in the intermediate portion of the flue 6. If it is found that the hot gas in the producer does not heat the air sufficiently to obtain the desired temperature, air is admitted through the port or ports 19, causing combustion in the upper part of the flue 6, and thus increasing the heating of the air.

The advantages of my invention result from the heating of the air by the radiation from the hot producer-gas, from the sucking action of the air-inlet ports, and from the high heat obtained and the economy of operation.

The device may be cheaply built and is not liable to get out of order.

Many changes may be made in the form and arrangement of the flues, the air-heating chambers, &c., without departing from my invention, and the burner may be applied to any type of furnace or heating apparatus.

I claim—

1. The combination with a gas-producer, of a valved outlet-flue leading therefrom and having a burner extension supported independently of the producer, an annular air-heating chamber in the wall of the extension, a set of ports leading from said heating-chamber into the burner-flue, and means for forcing air through the heating-chamber and into the flue; substantially as described.

2. The combination of a gas-producer, of an outlet for the hot gas therefrom, an air-heating chamber in the wall of the flue, and a forwardly-inclined air-port leading from the air-chamber into the gas-flue and arranged to

exert a sucking action upon the gas; substantially as described.

3. The combination of a gas-producer, of an outlet-flue for the hot gas therefrom, an annular heating-chamber surrounding a part of the flue, an air-inlet leading from the outer air into the gas-flue at a point intermediate of the length of the air-heating chamber, and ports leading from the air-heating chamber into the gas-flue beyond said air-inlet; substantially as described.

In testimony whereof I have hereunto set my hand.

WILLIAM H. BRADLEY.

Witnesses:
GEO. B. BLEMING,
L. M. REDMAN.