

No. 685,539.

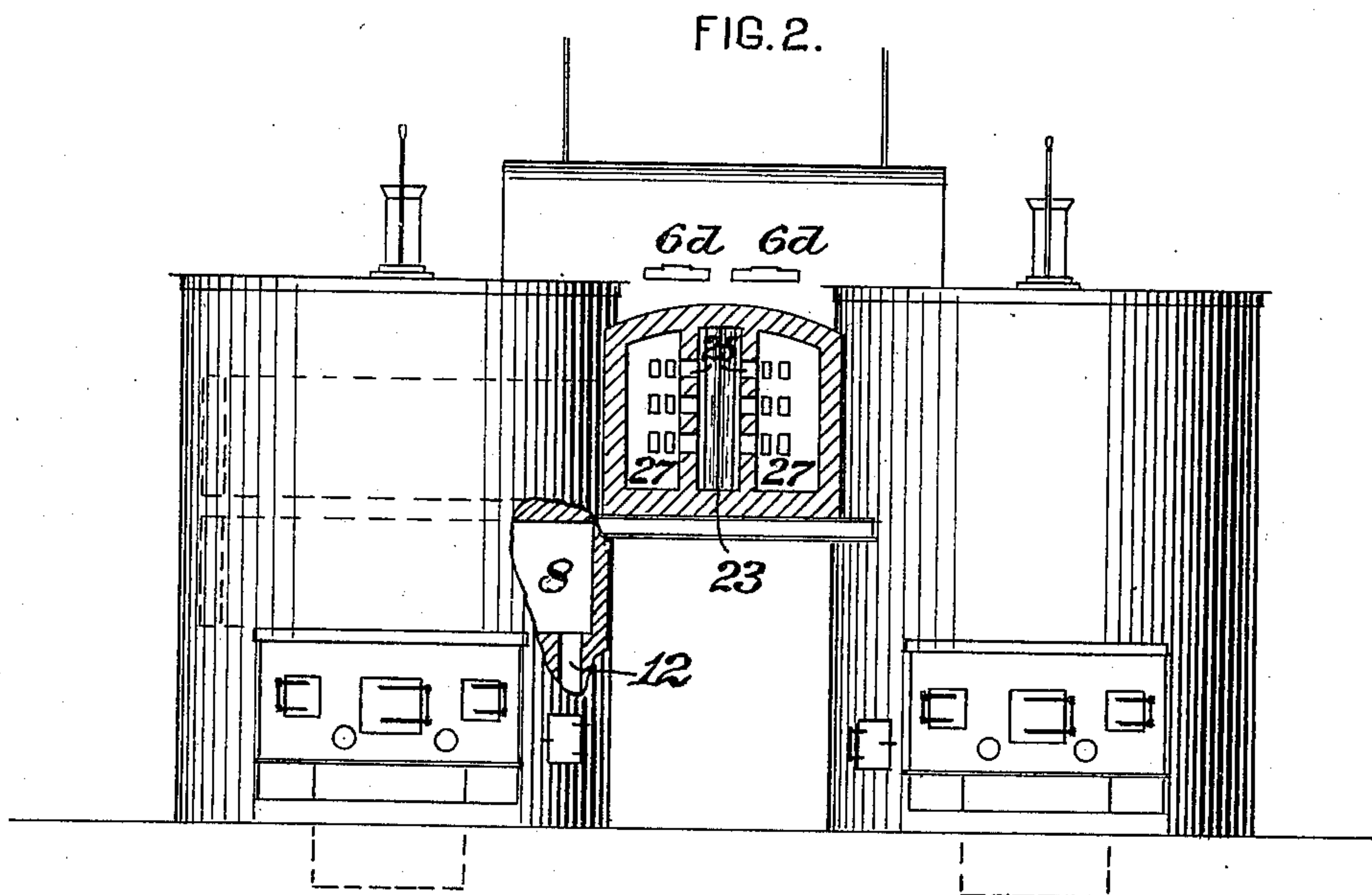
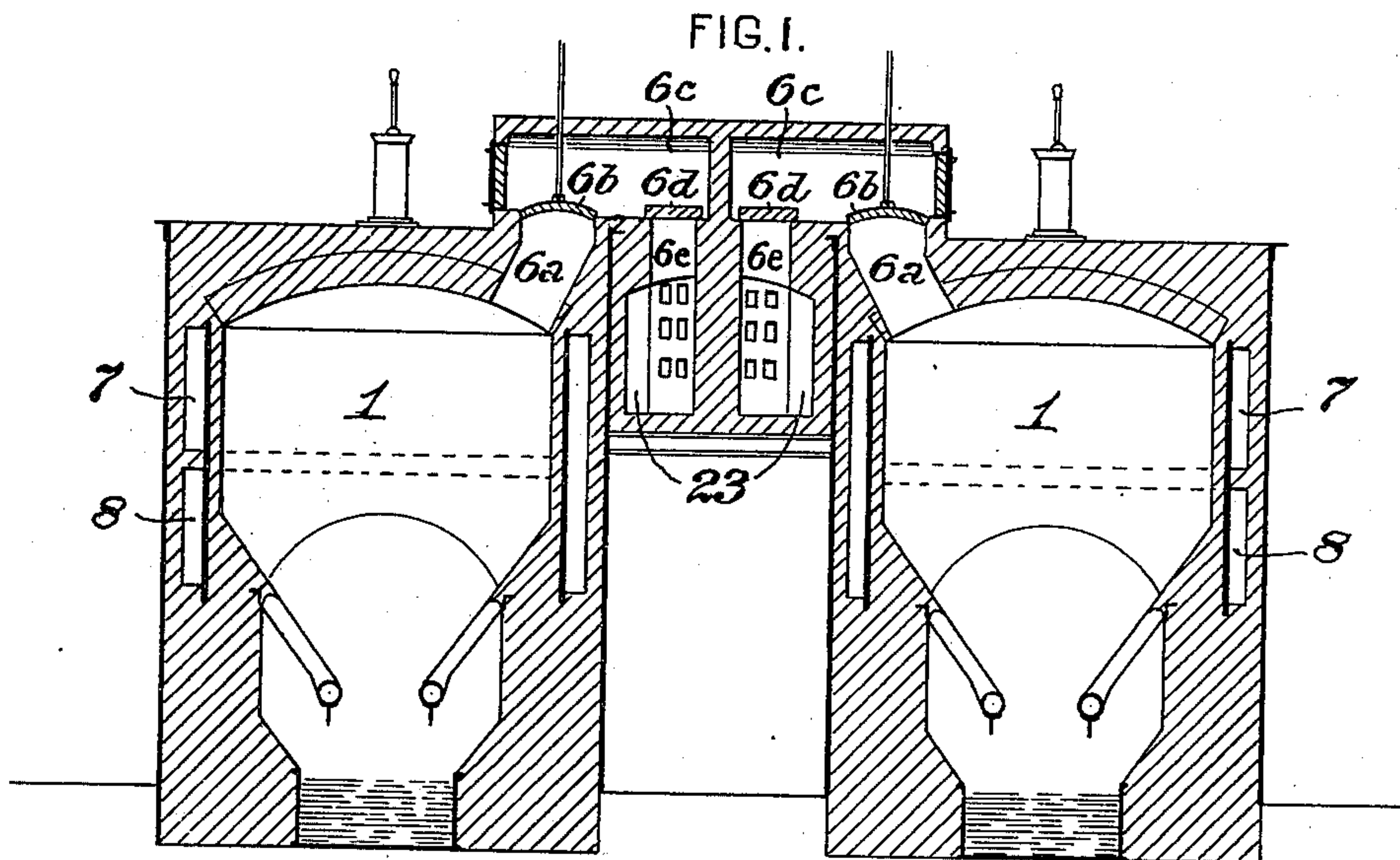
Patented Oct. 29, 1901.

W. SWINDELL.  
GAS FURNACE.

(Application filed Mar. 30, 1899.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

*James C. Herron.*  
*S. R. Bell.*

INVENTOR,

*Wm. Swindell.*  
*By J. Howard Bell.*  
Att'y.

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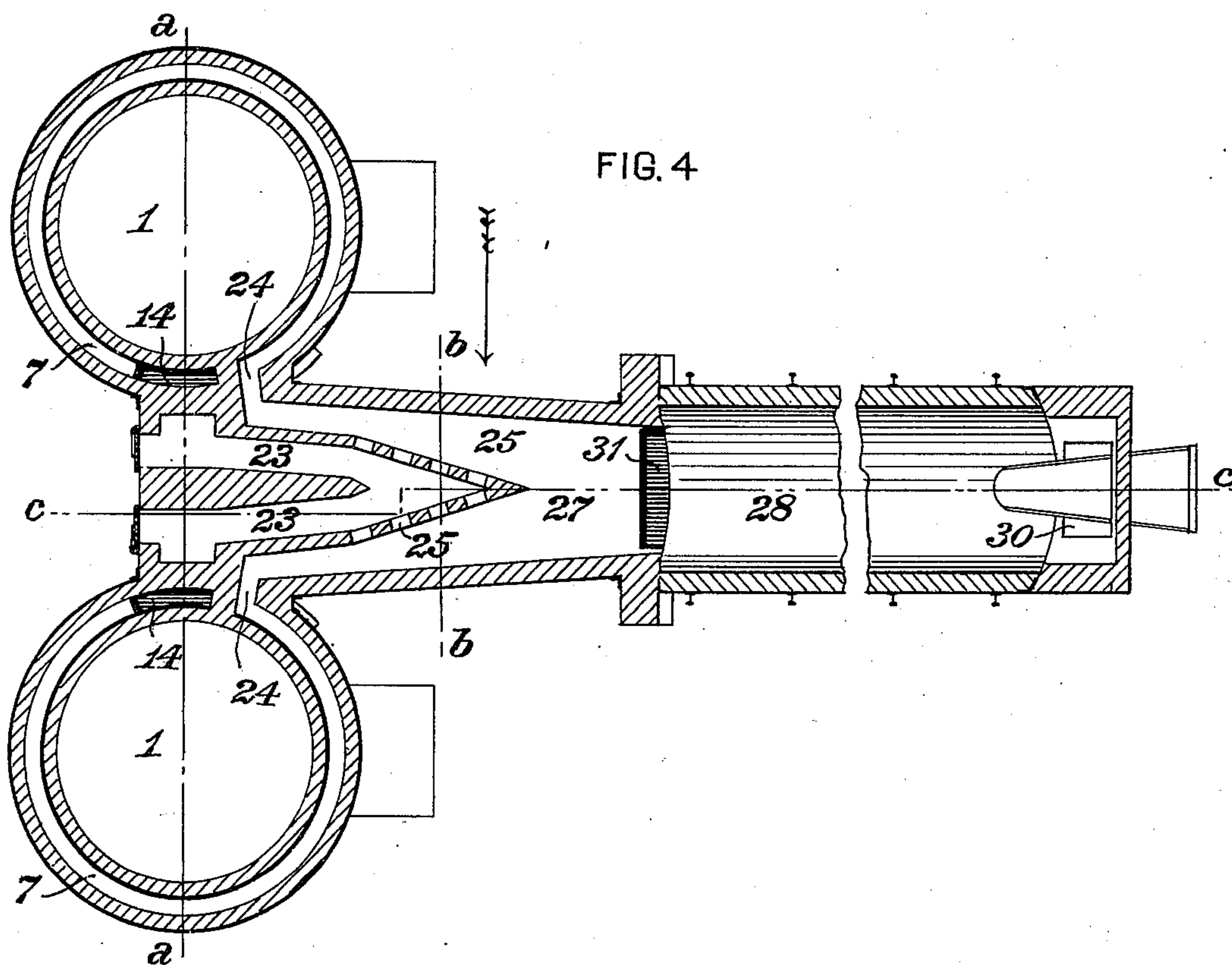
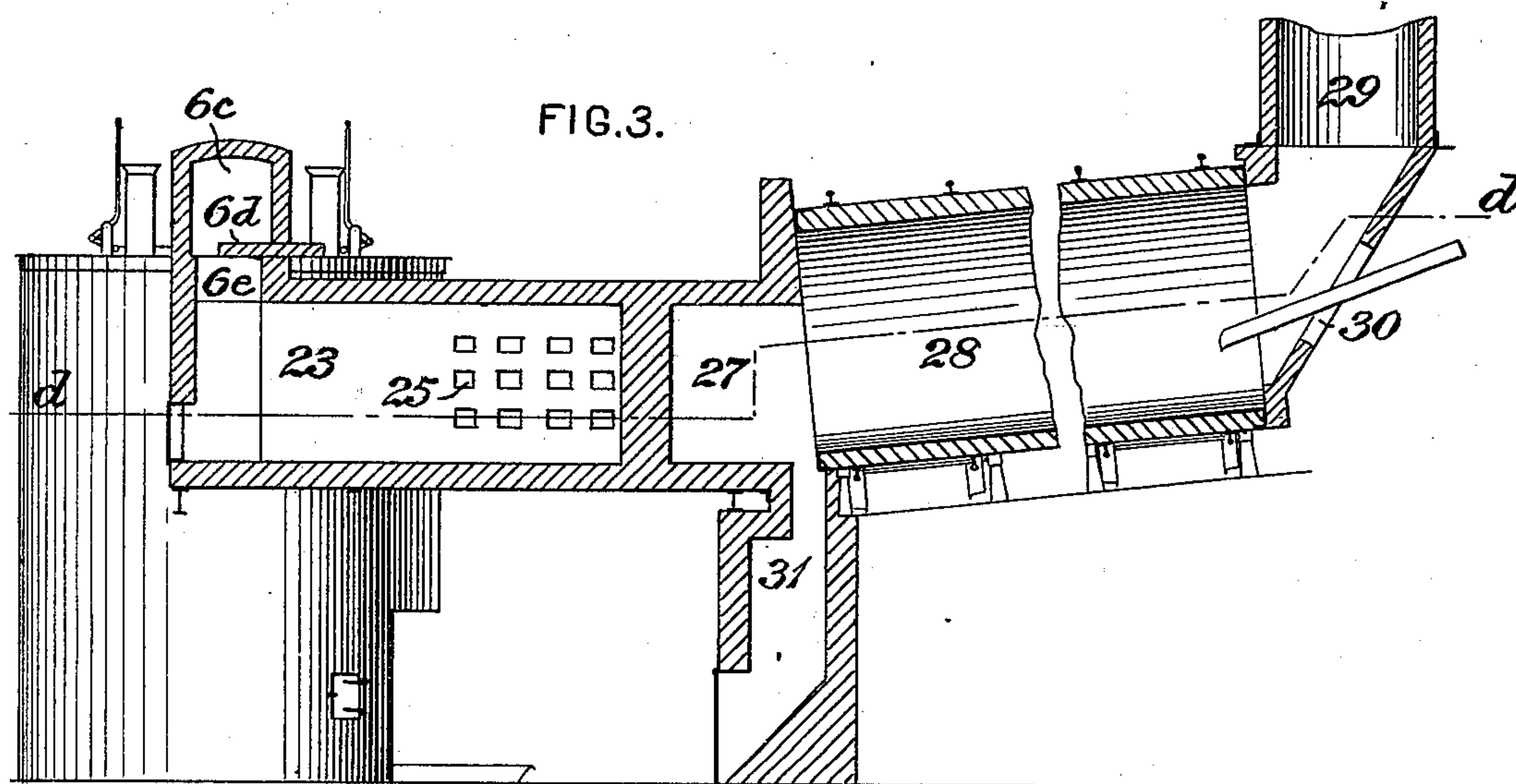
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2 Sheets—Sheet 2.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

WILLIAM SWINDELL, OF ALLEGHENY, PENNSYLVANIA.

## GAS-FURNACE.

SPECIFICATION forming part of Letters Patent No. 685,539, dated October 29, 1901.

Application filed March 30, 1899. Serial No. 711,069. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM SWINDELL, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Gas-Furnaces, of which improvement the following is a specification.

The object of my invention is to provide simple and inexpensive means whereby the combustion of a mixture of gas and heated air may be effectively and economically utilized in heating a furnace-chamber.

To this end my invention, generally stated, consists in the combination of a source of gas-supply, a source of heated-air supply, a mixing-chamber, a furnace or combustion chamber communicating therewith, an air-supply flue leading from the air-supply source to the mixing-chamber, and a gas-flue leading from the gas-supply source to the mixing-chamber.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a vertical transverse section through an apparatus embodying my invention at the line *a a* of Fig. 4; Fig. 2, a similar section at the line *b b* of Fig. 4; Fig. 3, a vertical longitudinal section at the line *c c* of Fig. 4, and Fig. 4 a horizontal section at the line *d d* of Fig. 3.

In the practice of my invention I provide a source of gas-supply, which is preferably, as shown, a gas-producer of any suitable and approved construction, one or more of which may be employed and two being shown in the drawings. I also provide a source of heated-air supply, which may be any suitable and preferred form of air-heating apparatus. In the instance exemplified the source of heated-air supply is an air-heating chamber composed of two superposed sections 7 8, surrounding the generating-chamber or fuel-chamber 1 of a gas-producer, connected with air-inlet passages 12 and connected one with the other by ports 14. The air-heating chambers 7 8 of the gas-producers shown accord in all substantial particulars of construction and relation to the gas-producers with that set forth in an application for Letters Patent filed by me under date of March 21, 1899, Serial No. 709,958, and not being in and of

themselves claimed as of my present invention need not be herein fully and at length set forth.

A mixing-chamber 27, which is preferably of substantially rectangular cross-section, extends from a point adjacent to the sources of gas and air supply to a furnace or combustion chamber 28, with which it is in open communication at its outer or farther end. The furnace-chamber is provided with a suitable exit or waste flue 29 and is, in the specific embodiment of my invention herein shown, an inclined drum or barrel adapted for drying material used in the manufacture of cement. The material to be dried is supplied to the chamber 28 through a feed-opening 30 at the end adjacent to the exit-flue 29, and the dried material is discharged through a downwardly-extending delivery-passage 31 at or near the end which adjoins the mixing-chamber. It will, however, be obvious to those skilled in the art that the furnace or combustion chamber 28 may without departure from the spirit of my invention be located either horizontally or vertically and be of any known and preferred form and construction.

An air-flue 24 leads from the source of heated-air supply, or one from each of said sources when two or more are employed, into the mixing-chamber 27, and a gas-flue 23 leads from the source of gas-supply, or one from each of said sources when two or more are employed, into the mixing-chamber. The gas flue or flues may, if desired, communicate with the mixing-chamber 27 by a single opening or passage; but such communication is preferably, as shown, effected through a plurality of mixing-ports 25, formed in the wall of the gas flue or flues adjacent to the terminal thereof in the mixing-chamber.

Communication between the gas-producers and the gas-flues 23 is controlled by suitable valves, the gas-outlets 6<sup>a</sup> in the construction shown leading into valve-chambers 6<sup>c</sup>, from which ports 6<sup>c</sup> lead to the respective gas-flues 23. The openings of the gas-outlets 6<sup>a</sup> are governed by lift or puppet valves 6<sup>b</sup> and those of the ports 6<sup>c</sup> by slide-valves 6<sup>d</sup>.

I claim as my invention and desire to secure by Letters Patent—

1. The combination of a gas-producing furnace having an air-heating chamber formed

in its walls, with a mixing-chamber and a combustion-chamber, and adjacent conduits conducting the hot gas and hot air to said mixing-chamber.

- 5 2. The combination of a gas-producing furnace having an air-heating chamber formed in its walls, with a mixing-chamber, separate but adjacent conduits leading from the fur-

nace and air-heating chambers respectively to the mixing-chamber, and a combustion-chamber in the form of a revolving drum opening into said mixing-chamber. 10

WILLIAM SWINDELL.

Witnesses:

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CLARENCE A. WILLIAMS.