

No. 702,418.

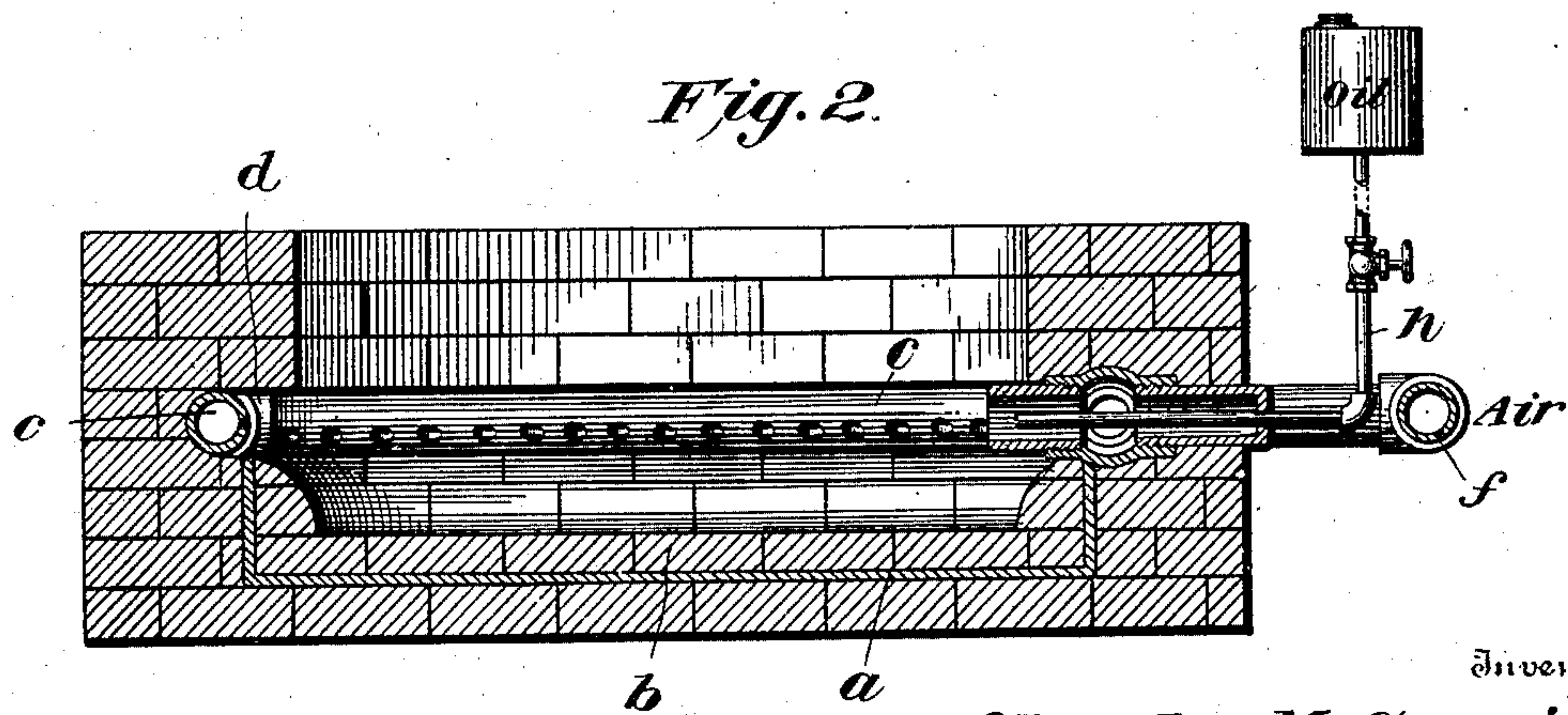
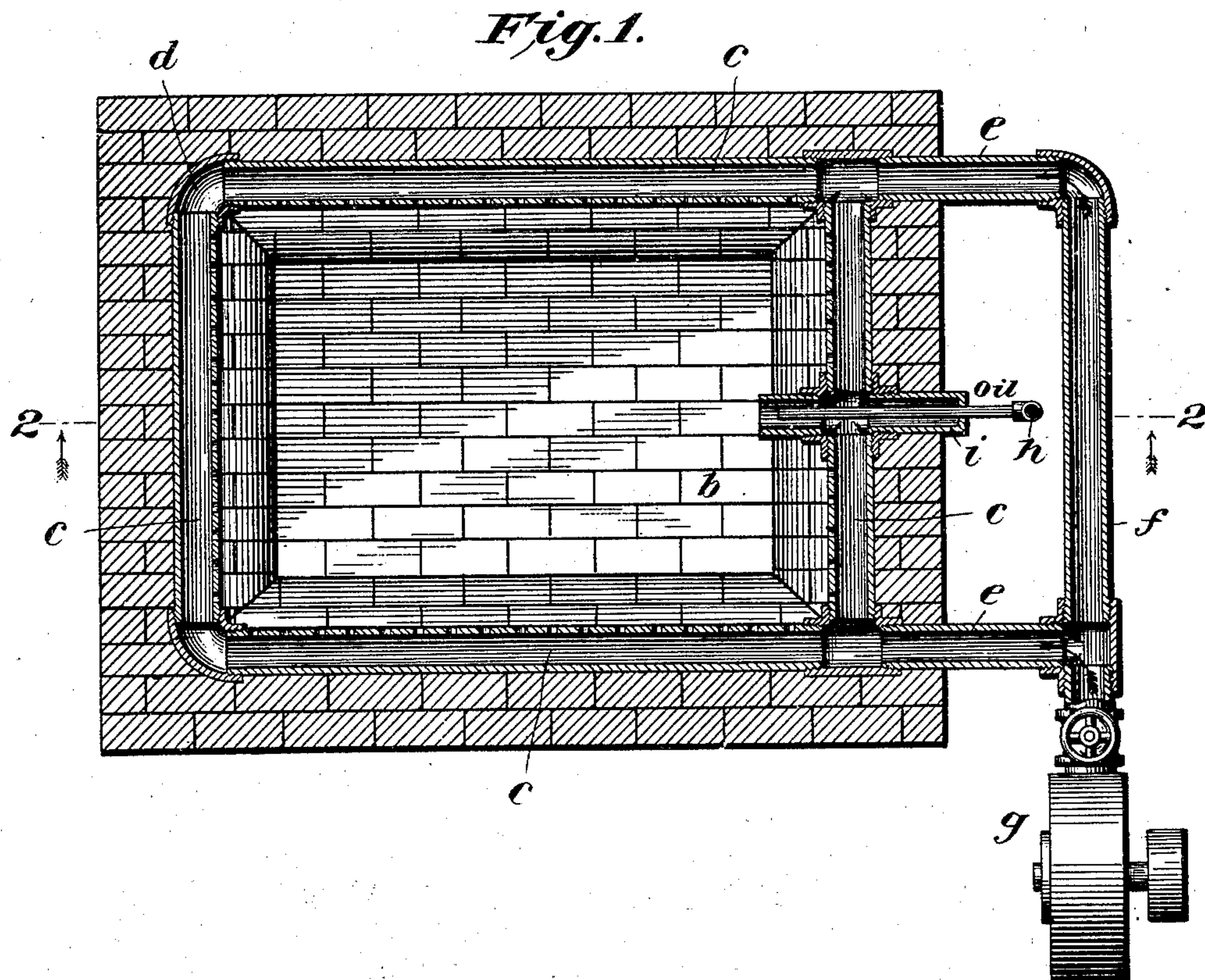
Patented June 17, 1902.

C. M. GEARING.

GAS GENERATING AND BURNING FURNACE.

(Application filed June 10, 1901.)

(No Model.)



Witnesses

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CHARLES M. GEARING, OF BROWNWOOD, TEXAS, ASSIGNOR OF THREE-FOURTHS TO CHARLES W. DROWN, ADOLPH GRIVOT, AND ALEXANDER C. LANDRY, OF NEW ORLEANS, LOUISIANA.

GAS GENERATING AND BURNING FURNACE.

SPECIFICATION forming part of Letters Patent No. 702,418, dated June 17, 1902.

Application filed June 10, 1901. Serial No. 63,879. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. GEARING, a citizen of the United States of America, residing at Brownwood, in the county of Brown and State of Texas, have invented certain new and useful Improvements in Gas Generating and Burning Furnaces, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 represents a horizontal section of a furnace provided with my invention, and Fig. 2 a vertical section taken on the line 2 2 of Fig. 1.

The idea this apparatus is based on is not to burn the oil direct, as is the case with the oil-burning furnaces now in use, but to so construct the fire-box that it first converts the oil into a crude oil-gas and then burns the gas directly in the fire-box in conjunction with air, the air being injected under pressure and thoroughly commingled with the crude gas at the point of burning, whereby intense and continuous combustion is provided without waste and with great economy. To carry out this idea, I employ a furnace built of masonry in such manner that its fire-box shall be entirely closed except where the air and oil pipes enter, so that no air shall enter the fire-box except through said pipes, whereby the generation and combustion of the gas may be entirely regulated by means of suitable valves in said pipes. In the bottom of the fire-box, where the ash-pit is usually located, is embedded a metal pan *a*, which serves to prevent the injected oil from percolating through the bottom of the furnace and wasting and which is lined with suitable refractory heat-retaining material *b*. Extending entirely around the fire-box is the air-pipe *c*, which is set back in a recess *d*, formed in the fire-box walls just above the pan and which is perforated along its inner side entirely around the fire-box, so as to inject the air into the same in numerous fine jets. Connected to each of the front corners of the air-conduit is an air-supply pipe *e*, both of which pipes extend out through the front wall of the furnace and are connected to a common pipe *f*, leading from the blower or pump *g* or

other source of pressure. The oil is supplied through a valved pipe *h*, which is connected to a suitable tank and extends into a nozzle *i*, attached to the front section of the encircling air-conduit and having its open inner end entering the fire-box through the front wall thereof. The exit end of the oil-pipe terminates near the inner end of the air-nozzle.

To start the apparatus, oil is permitted to run into the pan and is there ignited, sufficient air being also admitted to support combustion. The oil is thus burned direct until the refractory lining of the pan and the fire-box walls become intensely heated, which takes place in a short time, when the oil will be vaporized by contact with the highly-heated surfaces and be thenceforth burned as a crude gas. It will thus be observed that my apparatus is in reality a gas-generator as well as burner and that the gas is generated at the point of consumption—that is, in the fire-box—whereby great economy is secured and intense heat may be produced with the crudest of oils. It will be seen that this result is secured by entirely closing the fire-box and regulating the supply of oil and air thereto through the pipes and by lining the fire-box with refractory material which is capable of withstanding and retaining a high degree of heat. It will be further observed that the air-supply not only provides the oxygen necessary to support combustion, but also acts as a blast and intensifies and promotes combustion. It will be seen that practically all the fuel will be consumed; but should there be a residuum and it be advisable to clean or renew the pan-lining and the pipes the latter may be easily removed intact by simply removing a row or two of the brick of the front wall of the fire-box, all the air-pipes lying in the same horizontal plane and being connected together, so that they may be conveniently withdrawn through the opening thus made. By connecting an air-supply pipe to each of the front corners of the encircling pipe the supply to the opposite sides and ends of the latter will be substantially uniform, and by arranging the encircling pipe in a recess in the fire-box walls it is protected from the intense heat of the gas-flame. It will be observed,

further, that the encircling air-pipe is set far enough back in the recess *d* to prevent the perforations being closed by the fusing of the metal and also that the perforations in the
5 air-pipe open directly into the recess without the intervention of nozzles or tubes. Another essential feature is that the recess *d* is larger in diameter than the encircling pipe, so that the entire coil may be removed endwise
10 through the front wall of the furnace without disturbing any of the masonry of the furnace except the few bricks in the front wall that are in the same horizontal plane as the air-pipes.

15 Having thus fully described my invention, what I claim, and desire to obtain by Letters Patent, is—

1. In an oil-gas generating and burning furnace the combination of a fire-box, having a
20 bottom of refractory material and an open recess or chamber extending entirely around the fire-box and opening directly thereinto, a perforated air-pipe encircling the fire-box and located back in said recess and provided with
25 perforations opening directly thereinto, this piping being of smaller diameter than the outlet of said recess, an air-supply pipe connected to each of the front corners of said pipe and extending out through the front

wall of the furnace, a common pipe connect- 30
ing said two pipes and means for supplying air under pressure to this common pipe, an air-nozzle connected to the front portion of the encircling pipe at a point between the supply-pipes and extending into the furnace, 35
and an oil-supply pipe extending into this air-nozzle, as and for the purpose set forth.

2. In an oil-gas generating and burning furnace, the combination of a fire-box having a bottom of refractory material a recess or cham- 40
ber formed in its inner wall above said bottom and extending entirely around the fire-box and opening directly into the same, an air-pipe extending entirely around the fire-box and located back in said recess and pro- 45
vided with numerous perforations opening directly into said recess, this encircling pipe being of smaller diameter than the outlet of said recess, means for supplying air under pressure to this encircling pipe, and means 50
for supplying oil to the fire-box.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 6th day of June, 1901.

CHARLES M. GEARING.

Witnesses:

ARCH. GRINNAN,
ROBT. L. RUSSELL.