

F. J. ORR.
FURNACE FOR GAS GENERATORS.
APPLICATION FILED AUG. 18, 1911.

Patented June 18, 1912.

2 SHEETS—SHEET 1.

1,030,202.

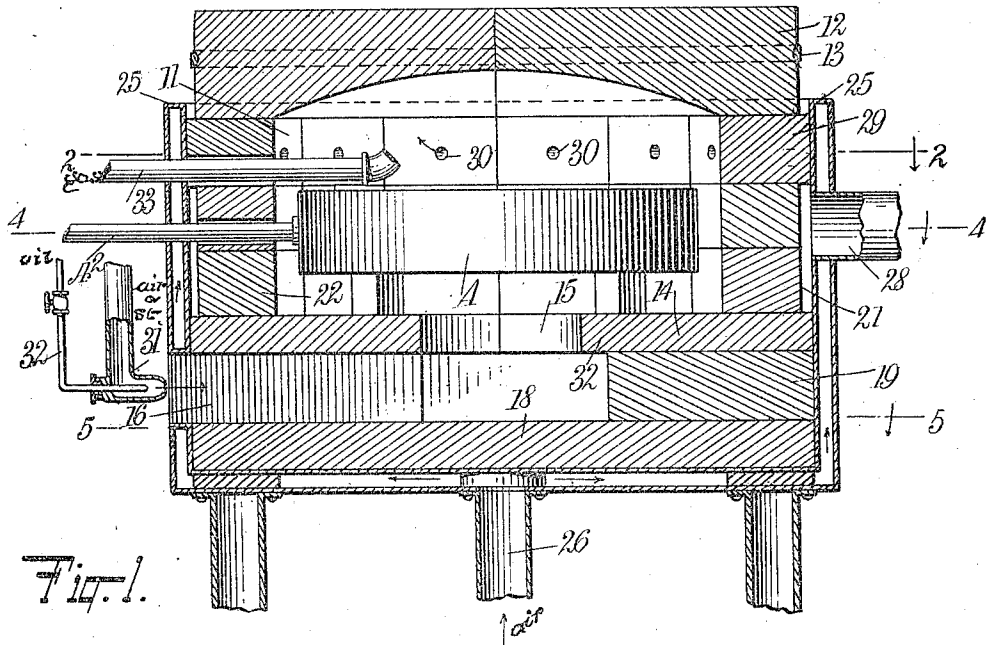


Fig. 1.

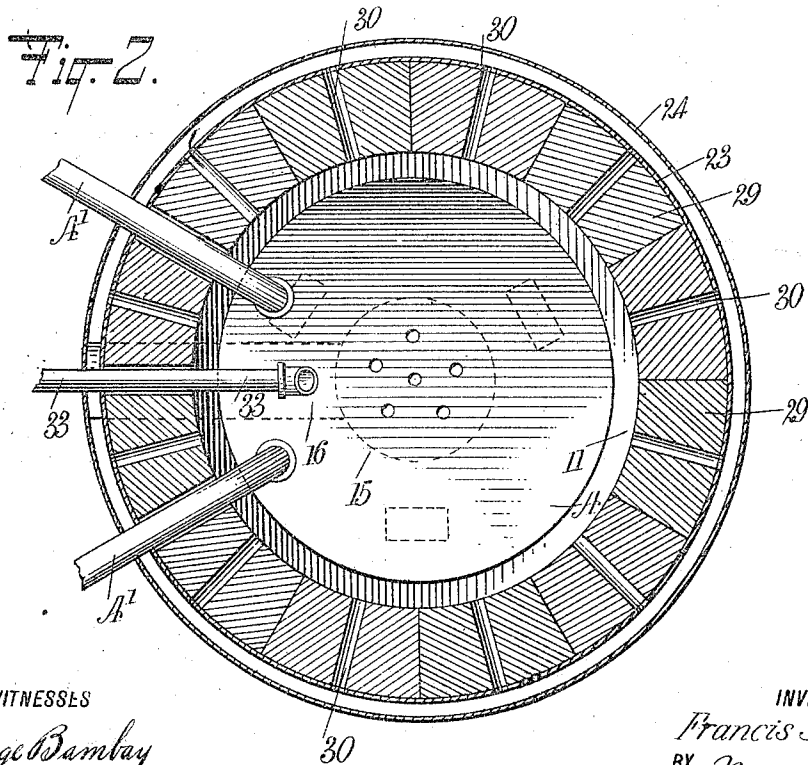


Fig. 2.

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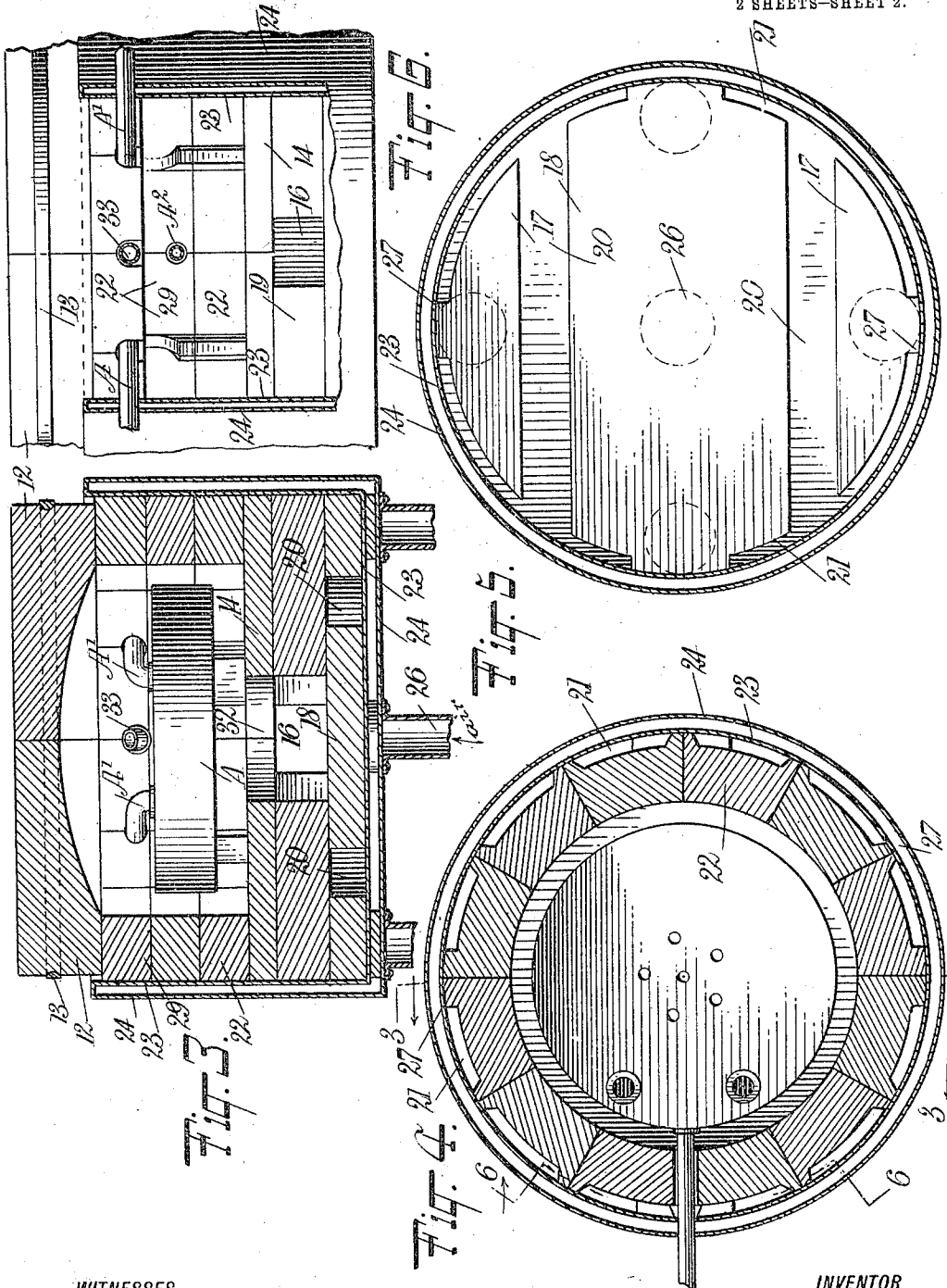
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UNITED STATES PATENT OFFICE.

FRANCIS J. ORR, OF BUFFALO, NEW YORK.

FURNACE FOR GAS-GENERATORS.

1,030,202.

Specification of Letters Patent.

Patented June 18, 1912.

Application filed August 18, 1911. Serial No. 644,829.

To all whom it may concern:

Be it known that I, FRANCIS J. ORR, a citizen of the United States, and a resident of Buffalo, in the county of Erie and State of New York, have invented a new and Improved Furnace for Gas-Generators, of which the following is a full, clear, and exact description.

The present application relates to improvements in furnaces for heating exteriorly the gas generators disclosed in an application for patent for improvements in system and apparatus for generating and burning oil gas, filed by me August 5, 1909, and bearing No. 511,291, which application was renewed June 30, 1911, bearing Serial No. 636,293, to which application cross reference is here made.

The present invention has for its principal objects to conserve the maximum units of heat by heating the walls and interior structure of the furnace to a radiating condition, which, after being raised to the necessary temperature, is there maintained by renewing the heat lost by radiation; and to provide a simplified form of conveyance or transfer of air and gas through the walls and structure of the furnace to produce the maximum effect.

One embodiment of the present invention is disclosed in the structure illustrated in the accompanying drawings, in which like characters of reference denote corresponding parts in all the views, and in which—

Figure 1 is a vertical section of a furnace taken on one of the diameters thereof; Fig. 2 is a cross section of the furnace taken on the line 2—2 in Fig. 1; Fig. 3 is a vertical section taken on the line 3—3 in Fig. 4; Fig. 4 is a cross section on diminished scale, the section being taken on the line 4—4 in Fig. 1; Fig. 5 is a cross section on diminished scale, the section being taken on the line 5—5 in Fig. 1; and Fig. 6 is a side view showing a fragment of the furnace and a section thereof taken on the line 6—6 in Fig. 4.

The construction and operation of the generator A is shown and described in the application for patent above referred to. It is found expedient and advantageous to hold this generator within the chamber of a suitable furnace. The furnace so designed is provided with the interior chamber 11. The chamber 11 is provided with a top formed by the blocks 12, the under surfaces

whereof are concaved to form the round dome above the body of the chamber 11. The blocks 12 are preferably four in number and are held in position by being bound by the strap 13. The side walls of the furnace are mounted and built upon the bottom tiles 14, which may be of fire brick, or other refractory material, and are preferably four in number and are so-shaped as to form, at the center of the furnace, an opening 15. The opening 15 communicates with a laterally opening passage 16. The tiles 14 rest upon the foundation 19 in which the passage 16 is formed. The foundation 19 rests upon the blocks 17, 17 and 18. Between the blocks 17 and the central block 18 are formed the transverse passages 20, 20. The passages 20, 20 are in open communication with the vertical passages 21. The vertical passages 21 are formed between the side walls 22 and the inner walls 23 of the hollow metal jacket with which the furnace is provided.

The hollow metal jacket is provided with the inner wall 23 and the outer wall 24, and is formed as an open box having vertical sides and a horizontally extended bottom. At the upper edge the walls 23 and 24 are capped by a closure edge 25. Opening into the hollow metal jacket, and preferably at the center of the bottom thereof, is a supply pipe 26.

The passages 21 are closed by the vertical walls 27 which are disposed in a plane perpendicular to the extension of the passages 20 and divide the passages 21 into two passages communicating on the one side with the delivery flue 28. The passages 21 are terminated at the upper end by the extension of the side wall blocks 29. The blocks 29 are extended to abut the inner walls 23 of the metal jacket. The blocks 29 are suitably provided with inlet passages 30 which, through registering perforations formed in the inner wall 23 of the jacket, form an opening communicating with the hollow space of the said jacket.

The pipe 26 is used to supply fresh air, the oxygen whereof is substantially burned in the chamber 11 of the furnace. This air is delivered through the pipe 26 and spread laterally between the walls 23 and 24, and is introduced into the chamber through the passages 30 where it supplies the necessary oxygen for sustaining combustion.

The passage 16 is utilized for introduc-

ing preliminarily the burning gas which is delivered from a torch 31, said torch being constructed and arranged substantially as disclosed in the application above referred to. Suffice for the present instance to say that the torch is provided to deliver air or steam while the pipe 32 delivers oil under pressure and under conditions as pointed out in said application. The torch 31 in its operation, delivers the flame thereof through the passage 16 against the farthest end thereof formed by the foundation 19. The tile 14 covering the farther end of the passage 11 overhangs the foundation, forming an overhanging wall 32 under which is formed a pocket where the flame is compelled to return upon itself, and whereby in the baffling effect thus produced the particles of the flame are more thoroughly combusted at the moment of entering the chamber 11. By this means the ignited gases are introduced into the chamber 11 at their highest temperatures to immediately absorb the oxygen from the air introduced through the passage 30 to form a superheated medium capable of sustaining chemical combustion.

After the furnace has been thoroughly primed, if so desired, the employment of the torch 31 may be discontinued, and the passage 16 is then closed or blocked. As described in the above cross-reference application the walls of the generator A are perforated to supply a certain proportion of the gas generated therein directly outward into the furnace. Under ordinary pressure this supply of gas is not sufficient to sustain the necessary combustion within the chamber 11, the additional gas required being supplied by the pipe 33 which is controlled by a suitable valve.

When the device is running at full capacity, and hence under greater pressure, more gas is forced through the said openings in the generator, and the pipe 33 may be shut off, more or less, by the valve. Thus heat of the generator may be kept at the desired point. This extra gas forced through the small openings is burned by forcing more air into chamber 11, or, allowed to pass unburned up the flue 28. Passing off the gas unburned is rendered unnecessary by providing the requisite number of small openings. Extra air for combustion purposes within the chamber 11 is obtained by pipe 26, control of which is obtained by means of a suitable valve.

After the necessary starting heat has been supplied and the walls of the chamber 11 have been thoroughly heated, the operation of the furnace is automatic. The greater the heat produced in the furnace the larger the quantity of gas admitted through the generator. The heat of the furnace is regulated and controlled in a large measure by

the amount of air supplied through the pipe 26 and hollow jacket surrounding the furnace.

In the operation of the furnace combusted gas and air are led through passages formed about the pipes A¹, A¹, A² and 33, through the wall 22 and into the passage 21 at the one side of the walls 27. In the passages 21 at the inner side of the walls 27 the air is carried down to the passages 20 which pass under the foundation 19 and communicate with the passages 21 on the opposite side of the furnace. The burned gas arises through the passage 21 on the far side of the furnace and enters the delivery flue 28.

It will be seen that the passages 21, 20, 21 are so situated as to surround the walls of the furnace, and to thus transmit in the passage from the chamber 11 to the flue 28 by radiation the maximum units of heat carried by the escaping burned air and gas. It will also be observed that by reason of the distribution of the passages 21 adjacent the inner wall of the hollow jacket the incoming air is pre-heated for delivery within the said chamber.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A furnace of the character described, comprising a totally inclosed heating chamber; a hollow walled jacket for said chamber having ducts opening into said chamber; two semicircular outlet passages in open communication with and encircling said chamber and connected by cross passages beneath said chamber; an outlet flue in open communication with one of the said outlet passages; and means for introducing and consuming a suitable combustibile in said chamber.

2. A furnace of the character described, comprising a totally inclosed heating chamber constructed from refractory material; a hollow walled jacket surrounding said chamber and separated therefrom to form two semicircular passages therebetween, said passages being in open communication with said chamber; a connecting passage beneath said chamber in open communication with said semicircular passages; and a delivery flue connected with one of said semicircular passages to convey off the products of combustion, and means for introducing and consuming a suitable combustibile in said chamber.

3. A furnace of the character described, comprising a totally inclosed heating chamber constructed of refractory material; a gas generator mounted within said chamber, said generator constructed to admit gas into said chamber; a heat starting passage extended under said chamber and having an opening centrally located therein; a torch to inject a flame into said starting passage;

a double walled hollow cup-shaped jacket to hold and bind in place the said refractory material; an air supply opening into said jacket; passages between said jacket and said chamber for the introduction of air therein above said generator; delivery passages opening from said chamber, and a flue to receive the contents of said delivery passages for conveyance away from said furnace.

4. In a furnace of the character described, a structure formed from refractory material disposed to form an inclosed retort chamber, a metal gas generator mounted within said chamber having means connected therewith

for delivering gas therefrom into the body of said chamber, and a series of passages leading from said chamber on one side of the diametric center under said chamber to the other side of said diametric center to form a circulation of the heated gas to infold said refractory material.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANCIS J. ORR.

Witnesses:

MARGARET TESSMER,

WILLIAM M. HAMILTON.