

No. 842,427.

PATENTED JAN. 29, 1907.

H. A. SCHNELBACH.

GAS FURNACE.

APPLICATION FILED AUG. 8, 1906.

Fig. 1

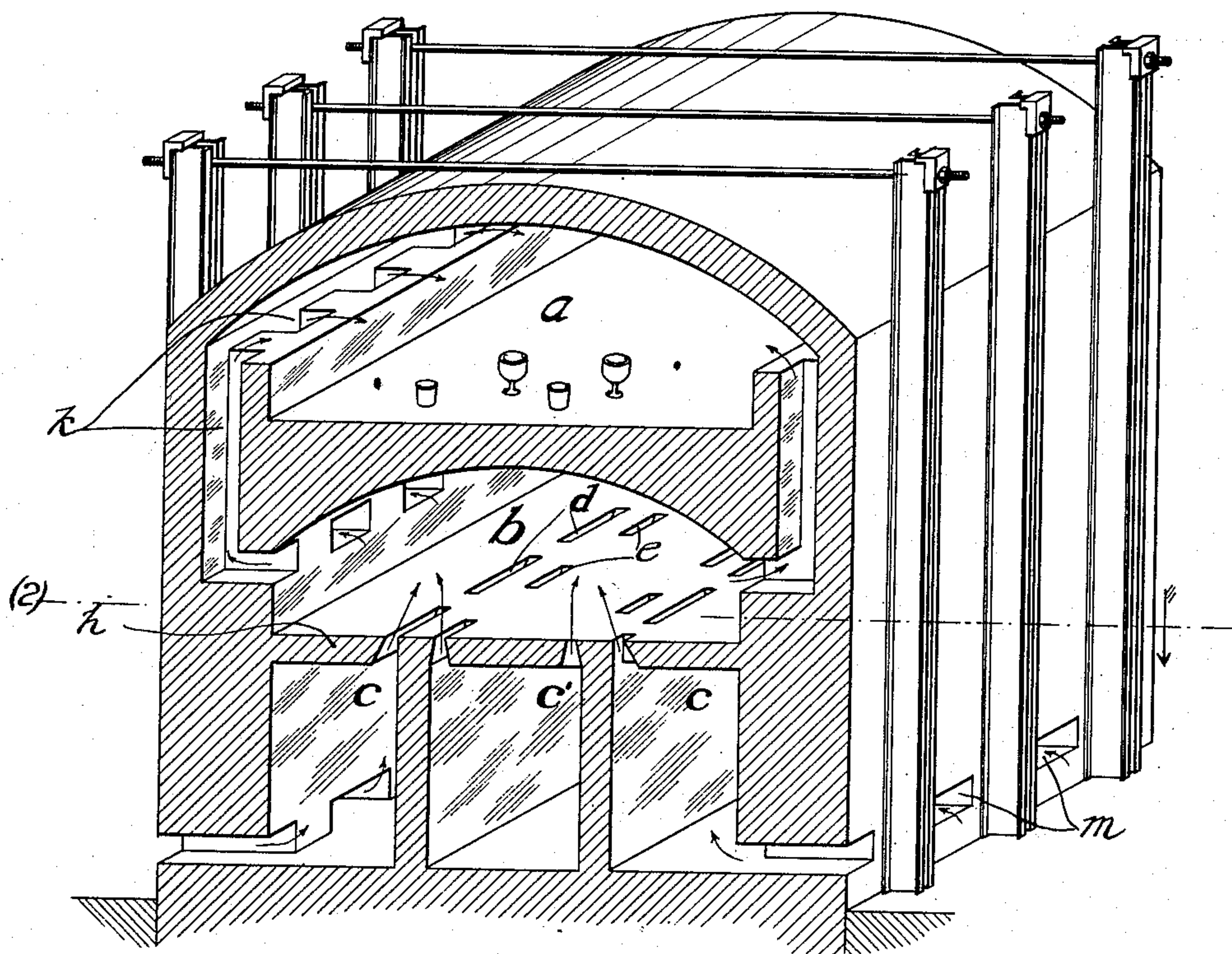
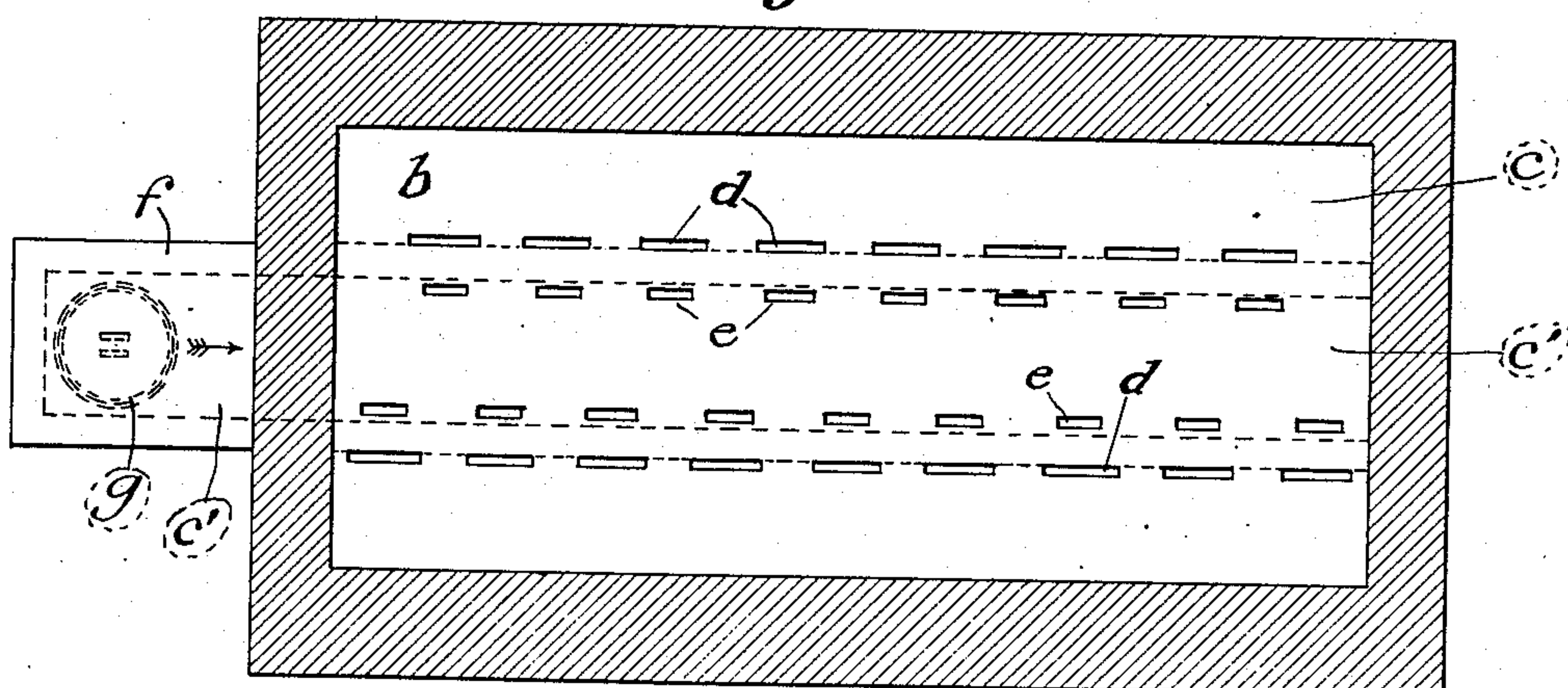


Fig. 2



Witness:

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Inventor,

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Att'y.

UNITED STATES PATENT OFFICE.

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GAS-FURNACE.

No. 842,427.

Specification of Letters Patent.

Patented Jan. 29, 1907.

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To all whom it may concern:

Be it known that I, HENRY A. SCHNELBACH, a citizen of the United States, residing at Pittsburg, in the State of Pennsylvania, have invented certain new and useful Improvements in Gas-Furnaces, of which the following is a specification.

My invention relates to furnaces adapted to burn such gases as commonly known as "producer-gas," in which there is a great deal of free carbon; and its primary objects are to properly mix a proper quantity of air with the gas to promote complete combustion and cause the combustion to proceed at a proper rate, to completely burn such gaseous fuel, to cheapen and simplify the construction of the furnace, to produce a flame adapted to special uses, and to generally improve the construction of furnaces for the purposes hereinafter set forth. These objects and other advantages are gained by the construction illustrated in one form in the accompanying drawings, wherein—

Figure 1 is a partial perspective and a vertical transverse section of the furnace; and Fig. 2 is a horizontal section of the same, taken on the line 2 in Fig. 1.

It has ordinarily been practically impossible to burn producer-gas in furnaces such as used for boilers or for annealing in glass-houses, &c., and especially to do so with the natural draft of air. Not only has it been found impracticable to get sufficient quantity of air at exactly the right place, but if such result was obtained the burning took place immediately at the outlet of air and the flame was hottest at a point where the heat was not needed and rapidly dissipated as the flame approached the object to be heated. In order to overcome these difficulties, it will be seen that I have provided under the object to be heated (which in this case is the annealing-chamber *a*) a combustion-chamber *b*, having a flat perforated floor. Centrally located beneath the floor and chamber *b* is a gas-supply chamber *c'*, which may be connected directly with a sewer or other conductor *f*, introducing the producer-gas through a convenient valve *g*. On each side of the gas-chamber *c'* is an air-chamber *c*, which is preferably of nearly double the size of the gas-chamber and is fed by natural draft by simply leaving the end of cham-

ber *c* open or by means of numerous openings *m* through the side of the furnace. The gas-chamber *c'* has a series of small slots in its top *e*, which are preferably of converging form, as shown, and in close proximity to them are a series of slots *d*, similarly converging and opening through the top of the air-passages *c*. It will be observed from Fig. 2 that these slots open near each other and that the slots *e* and *d* are made in sizes corresponding to the proper proportions of air and gas, which are ordinarily about two to one; also, that the pairs of cooperating openings *d e* are staggered with respect to the median line of the gas-chamber, so that the flames burning on the floor of the chamber *b* alternate with each other, so as not to interfere. The flame after complete combustion in chamber *b* passes through the passages *k* into the leer or under a boiler or to any other place where the heat is to be applied.

It will be seen that in this construction the numerous flames burn on a flat floor in the chamber *b* and that the gas in passage from openings *e* to outlets *k* must pass through a thin sheet of air drawn through the slots *d*. The result is to thoroughly mix an amply sufficient quantity of air with the producer-gas and give the flame time to reach the passages *k* before its highest heat is reached. Thus the smoke is entirely burned out of the gas and a pure flame is secured, as well as the maximum amount of heat which can be obtained from the burning of the quantity of gas. The construction is cheap and simple, so that the accurate designing usually necessary in such furnaces is obviated.

While I have illustrated the construction as applied to a glass-annealing leer, it will be understood, of course, that the invention is clearly applicable to steam-boilers or any other position where a furnace is to be used for burning producer-gas. Various advantages of the invention will readily occur to those familiar with the art.

Having thus described my invention and illustrated its use, what I claim is new, and desire to secure by Letters Patent, is the following:

1. A furnace comprising a combustion-chamber, a gas-chamber underneath the same having narrow slots opening through

its top, and an air-chamber lying closely contiguous to the gas-chamber and having corresponding narrow slots opening through its top in close proximity to said gas-outlets, whereby the air and gas are mixed immediately at their outlet from the supply-chambers.

2. A furnace comprising a combustion-chamber with a flat floor, a centrally-located relatively large gas-chamber under said floor and communicating therewith through a series of narrow slots; outlet-passages for the flame and a heating-chamber, and a pair of natural-draft air-passages close to and on the sides of the gas-chamber and having slots opening through said floor in close proximity to the gas-outlets, substantially as described.

3. A furnace for producer-gas comprising a flat-bottomed combustion-chamber a gas-chamber beneath and opening through said floor by narrow slots and air-chambers on the sides of the gas-chamber, fed by natural draft and opening into the combustion-chamber by narrow slots lying close to the gas-openings, said slots being converging and arranged in pairs staggered in position, substantially as described.

In testimony whereof I have hereunto signed my name in the presence of two witnesses.

HENRY A. SCHNELBACH.

Witnesses:

CHAS. S. LEPLEY,

F. W. H. CLAY