(No Model.) 2 Sheets—Sheet 1.

C. H. VANNIER.

COKE OVEN.

No. 537,872. Patented Apr. 23, 1895.

Fig. 1.

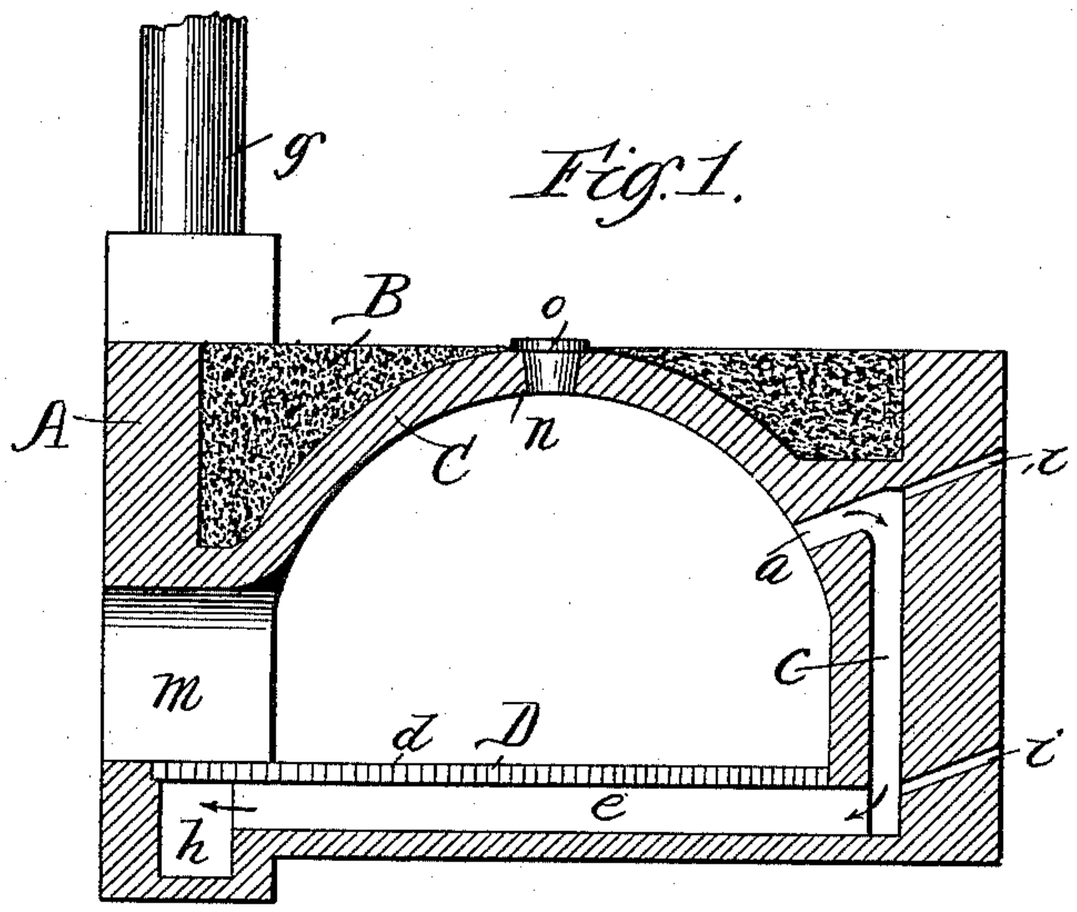
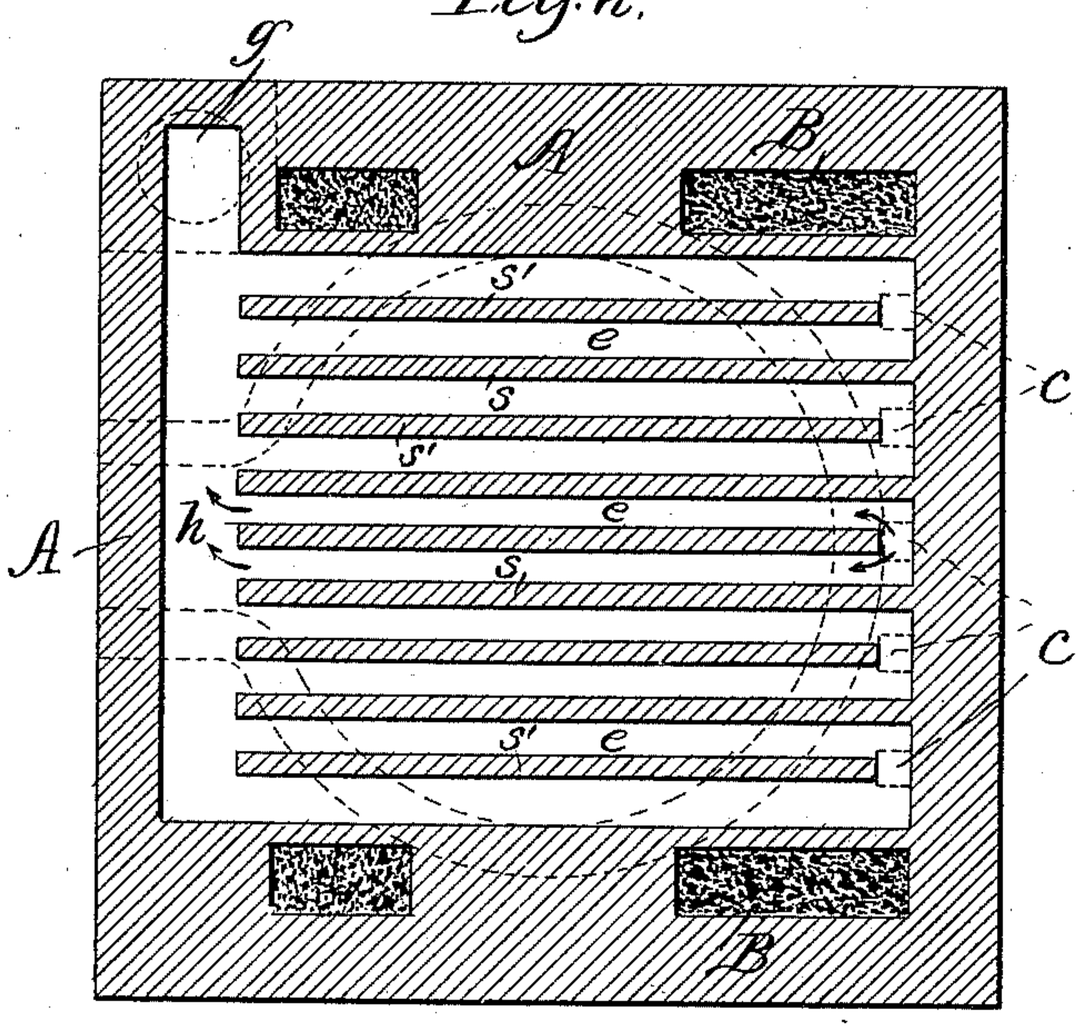


Fig. 2.



Witnesses.
Wm. M. Rheem.
Wm. J. Fleming.

Inventor
Chas. H. Vannier
by Raymond & Quohundro
Atty's

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

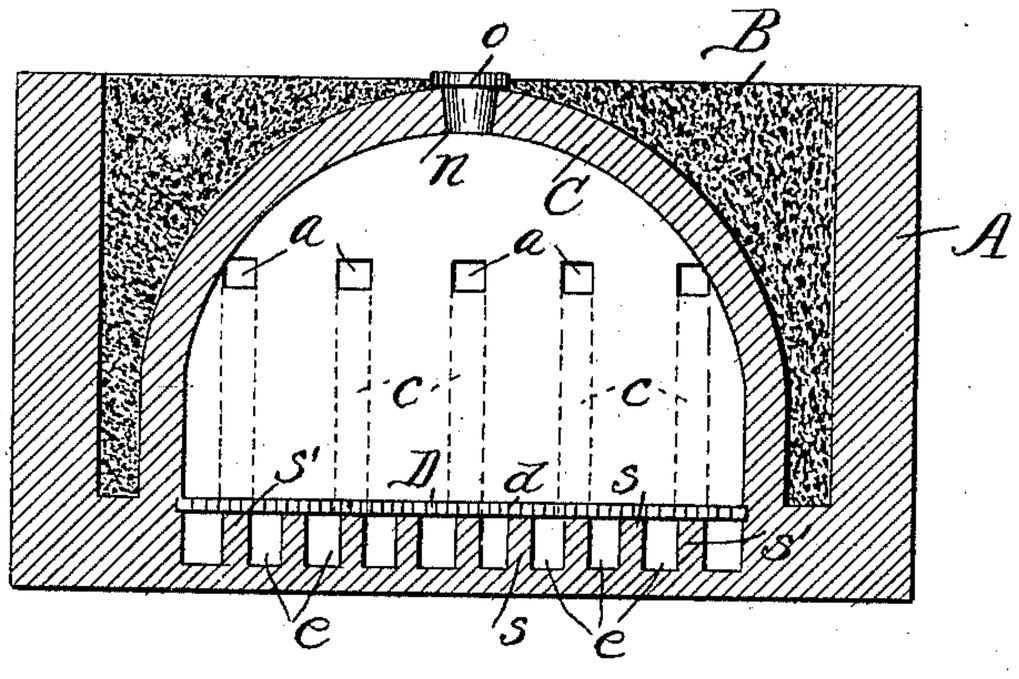


Fig. 4.

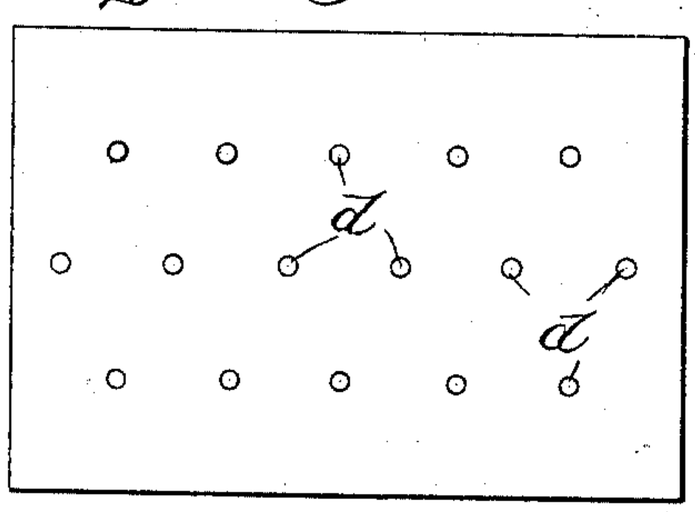
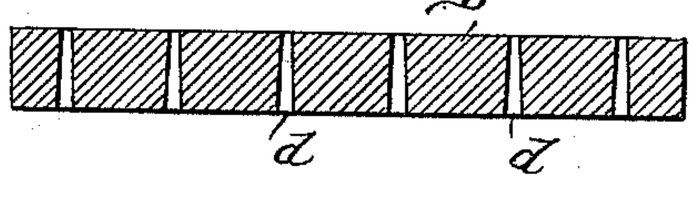


Fig. 5.



Witnesses.

Wm. N. Rheems.

Wm. F. Fleming

Inventor.

Chas. H. Vannier

by Raymond & Quohundro.

Atty's

UNITED STATES PATENT OFFICE.

CHARLES H. VANNIER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE GRIFFIN WHEEL COMPANY, OF SAME PLACE.

COKE-OVEN.

SPECIFICATION forming part of Letters Patent No. 537,872, dated April 23, 1895.

Application filed June 28, 1894. Serial No. 515,971. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. VANNIER, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Coke-Ovens, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

The invention relates to coke ovens of the bee-hive type.

The primary object of my invention is to construct a simple, economical and lasting structure.

A further object of the invention is to produce a high grade of coke in a much shorter space of time than other ovens of this type or any other type, and also to utilize an inferior grade of coal heretofore of practically no value for the purpose, and produce therefrom a good quality of coke.

Further by my invention, I am enabled to so thoroughly utilize the gases produced during the coking process for the purpose of promoting combustion as to reduce the escape of unspent gases into the atmosphere to a minimum.

The invention consists in a coking-oven having substantially a dome-shaped top and constructed with a series of flues or openings in the back wall of the oven, opposite the door, said openings or flues leading at an angle tending upward and terminating in vertical flues running downward, inclined air openings leading into said vertical flues, the latter communicating with a series of parallel horizontal flues running under the perforated bottom of the oven and thence into a common flue leading to the chimney.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a longitudinal sectional elevation of my improved oven; Fig. 2, a sectional plan view, illustrating the arrangement of parallel flues and partitions in the bottom of the oven. Fig. 3 is a cross-sectional elevation; Fig. 4, a plan view of the perforated oven bottom or grate, and Fig. 5 is a cross-sectional elevation of said perforated bottom showing the form of the perforations therein.

A represents the wall of the oven, constructed in any suitable and well known manner, and of any desirable material, and B is a filling of sand suitably arranged around or about the said walls for the purpose of materially adding to the life and endurance of the same. The upper portion of the oven is dome-shaped, as clearly shown at C, Figs. 1 and 3. The oven is equipped with a series of openings or flues *a*, as also clearly shown in Figs. 1 and 3, and are arranged in the back of the wall opposite the door of the oven, and extend slightly upward and at an angle.

c represents a series of vertical flues in the rear wall of the oven running downward to a point below the floor of the same; D, the perforated floor provided with perforations *d*, and *e*, a series of parallel horizontal flues arranged under the floor and leading into a common flue *h*, the latter communicating with the chimney *g*.

i, *i'* are inclined air openings located in the rear wall and leading from the outside of the oven to and communicating with the vertical flues *c* for the purpose of supplying the necessary oxygen for the complete and thorough combustion of the gases during the coking process.

m represents the door of the oven for removing the coke therefrom and is intended to be suitably walled up during the operation.

n indicates the opening in the oven dome for introducing the charge of coal, and *o* is the plug or cover for closing said opening.

s designates a series of parallel horizontal walls or partitions, preferably integral with the rear main wall of the oven below the oven bottom and alternately arranged between the vertical flues *c*, as clearly shown in Fig. 2, and *s'* is a series of parallel horizontal walls or partitions, similarly located, and alternating between said walls *s*, the partitions or walls *s* and *s'* thereby forming in that portion of the structure beneath the oven bottom a series of parallel flues *e*, as illustrated in said Fig. 2. The walls *s* being of a width less than that of

the vertical flues, serve to divide the gases at a point where the vertical flues discharge into the parallel flues. Hence each of the vertical flues supplies two of the parallel horizontal flues, thereby thoroughly and uniformly distributing the gases under the entire area of the oven bottom.

It will be understood that the inclined air openings, which also serve as peep-holes, may be provided on the outside of the structure with adjustable covers made of isinglass, or other suitable covers, or may be provided with a regulating device, with which to control the amount of air which is required or desired to pass into the vertical combustion flues, in order to so regulate the air that it will flow into the combustion flues without passing over the coals, and that each flue may be regulated so as to provide the requisite amount of air to induce the proper heating or burning of the gases in each flue.

Owing to the extreme simplicity of this construction of oven, the coking process or operation is readily obvious.

When the oven is charged with bituminous coal, which is supported upon the perforated bottom or grate, the supply opening *n* is closed; the door *m* is closed or walled up, and the gases or volatile products emanating from the coal pass into the openings or flues *a*, located immediately above the coal bed, thence slightly upward and into the vertical flues, the latter being supplied with oxygen to ignite the gases through the medium of the downwardly inclined air openings *i*, *i'*. The gases thence pass downwardly and into the series of parallel flues *e*, by which they are distributed under the entire area of the bottom of the oven, the non-combustible gases only passing into the common flue and from thence to the chimney. Thus, the uniform heating of said oven bottom is insured as well as the even and uniform burning of the coke, which is of prime importance to the value of the product. As soon as the bottom becomes heated, the burning of the gases begins in the vertical flues and the coal gives off part of its gases or volatile products through the perforations *d*, distributed over the surface of the tiles, which latter form the oven bottom. A portion of these gases, which form during the coking process, escape through the perforations and are ignited in the horizontal flues, thus materially aiding in providing a high temperature under the oven and insuring very rapid and uniform coking.

The entire oven bottom is so highly and uniformly heated that when the coke is removed and a fresh supply of coal is placed thereon, the gases will be driven out of the coal immediately and the process of coking at once begun, which process can be carried on indefinitely.

I desire to be understood that changes from the exact construction as illustrated and described may be resorted to without departing from the spirit of my invention.

What I desire to claim and secure by Letters Patent is—

1. A coking oven having a dome-shaped top and flat bottom, a series of straight horizontal flues arranged beneath the bottom and communicating with a common transverse flue, a series of straight vertical flues in the rear wall each vertical flue having direct communication with two of said horizontal flues, the inclined flues leading from the tops of the vertical flues into the oven, and one or more inclined air-passages leading into each vertical flue, substantially as shown and described.

2. A coking oven, having a dome-shaped top and flat bottom, a series of parallel partitions arranged beneath the bottom providing a series of straight flues, each alternate partition extending to and integral with the rear wall of the oven, a series of straight vertical flues arranged in the rear wall and at the rear of each alterate partition, each vertical flue communicating with two horizontal flues beneath the floor, the flues leading into the oven, and the air-passages leading into each vertical flue, substantially as shown and described.

3. A coking oven, having a dome-shaped top, a flat perforated bottom, a door at the front, and an opening at the top, the series of horizontal flues, the series of vertical flues communicating therewith, the inclined flues leading from the vertical flues into the oven, the air passages leading into each vertical flue, all of said flues being arranged substantially as shown and described.

4. A coke oven provided with openings or flues in the back thereof and leading into vertical flues, air openings communicating with the vertical flues and each of the latter communicating with two of the parallel horizontal flues, substantially as set forth.

5. A coke oven provided with openings or flues in the back thereof and leading into vertical flues, air openings communcating with each of the vertical flues, the latter communicating with the parallel flues, and two series of partitions located beneath the oven bottom, one series of which forms a solid wall between the parallel flues, substantially as set forth.

CHARLES H. VANNIER.

Witnesses:
CHAS. B. BOWEN,
M. E. SHIELDS.