

(No Model.)

H. M. PIERCE.

COKE OVEN.

No. 318,496.

Patented May 26, 1885.

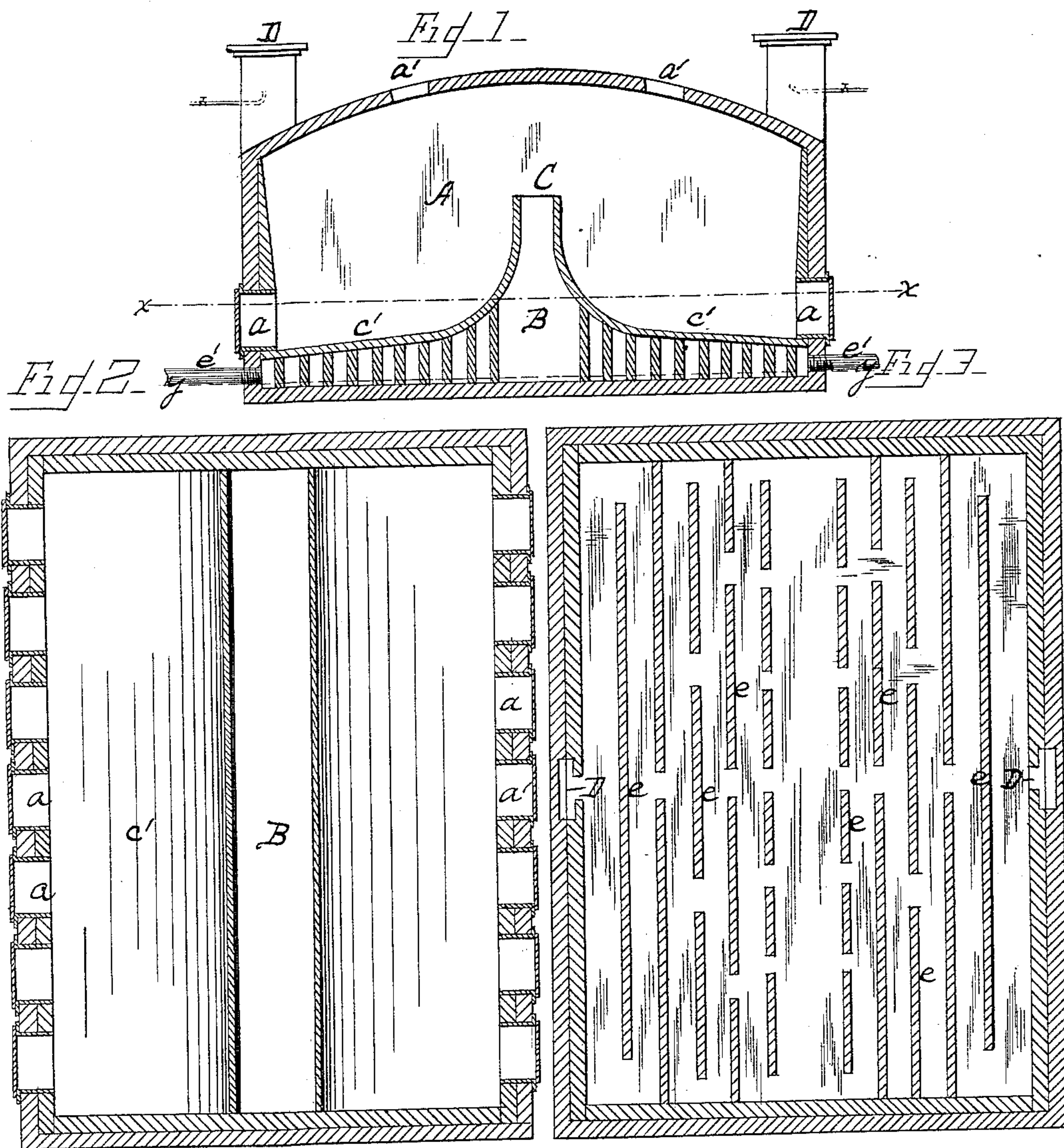
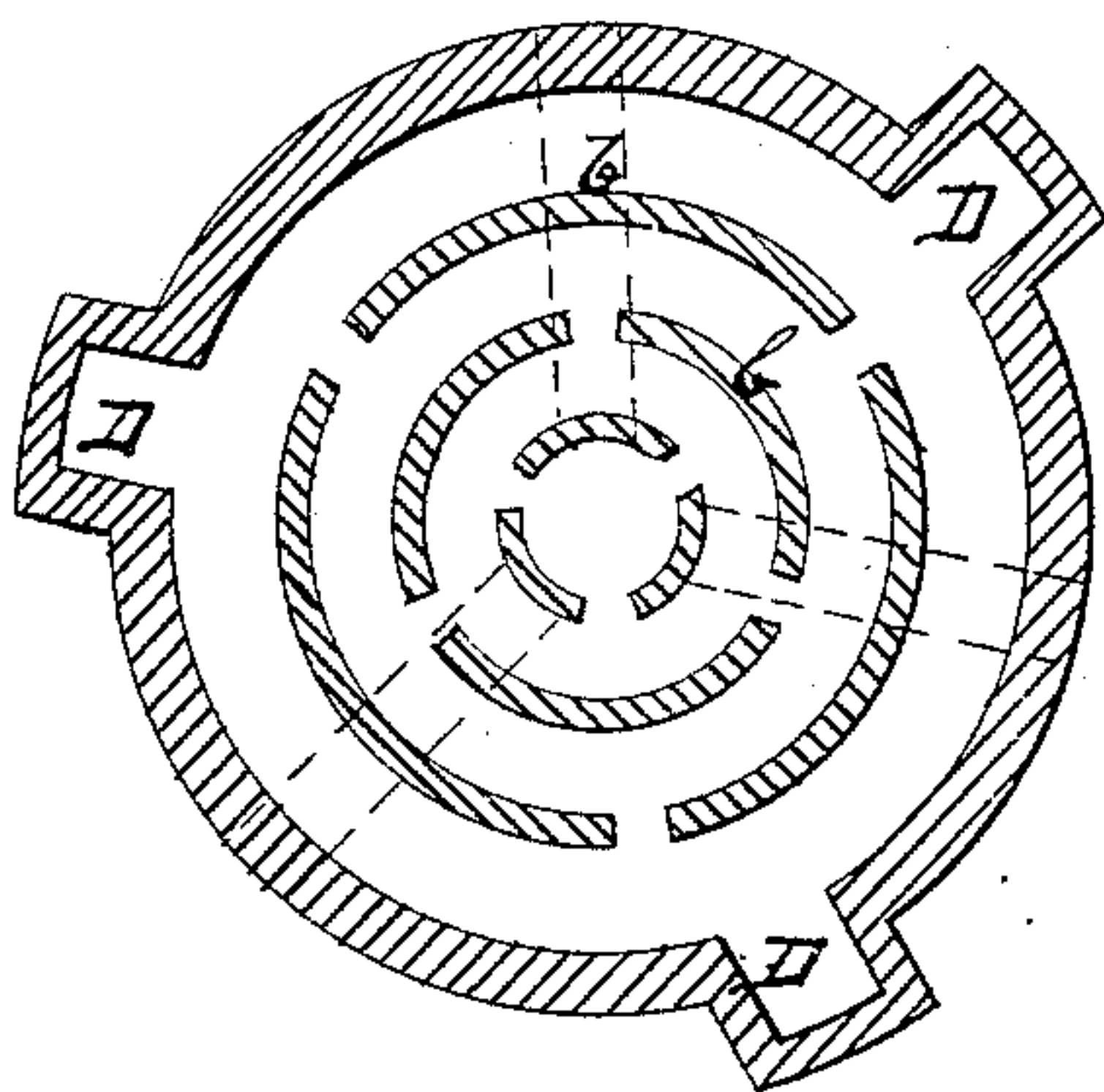


Fig. 4.



Witnesses.

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# UNITED STATES PATENT OFFICE.

HENRY M. PIERCE, OF NASHVILLE, TENNESSEE.

## COKE-OVEN.

SPECIFICATION forming part of Letters Patent No. 318,496, dated May 26, 1885.

Application filed July 31, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY M. PIERCE, a citizen of the United States, residing at Nashville, in the county of Davidson and State of Tennessee, have invented certain new and useful Improvements in Coke-Ovens; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—  
10 Figure 1 is a vertical central section of an oven embodying my improvements. Fig. 2 is a horizontal section on the line  $xx$  of Fig. 1, showing interior of coking-chamber. Fig. 3 is a similar section on the line  $yy$ , Fig. 1, showing the combustion flues or chamber below the coking-chamber. Fig. 4 illustrates in cross-section my invention as applied to a circular kiln.

Like letters refer to like parts wherever they occur.

This invention relates to the construction of that class of coke-ovens more especially intended to utilize the volatile matter and gases given off or evolved from the charge during the coking process, for the purpose of supplying the heat by which the coking process is conducted.

The main feature of the present invention consists in combining with a coking-chamber having a series of combustion flues or chambers arranged immediately under the coking-chamber, wherein the gas eliminated from the charge is burned, one or more flues or down-takes, which gather the gases, &c., from the coking-chamber and deliver them to the combustion chambers or flues.

A secondary feature consists in forming the coking-chamber with a sloping floor or mound inclining in all directions from the gas-exit flue or flues to the doors or discharge-openings of the oven, whereby the withdrawal of the coke is facilitated after the coking process is completed.

There are other and minor details of novel construction, as will hereinafter more fully appear.

I will now proceed to describe my invention more specifically, so that others skilled in the art to which it appertains may apply the same.

50 The oven is composed of the coking-chamber A, the combustion-chamber B, arranged

immediately below the floor of the coking-chamber, and the vertical gas-exit flue C, which extends from the middle or upper part of the coking-chamber A down into the combustion-chamber B.

In constructing the coking-chamber it is provided with the usual doors,  $a$ , for withdrawing the coked charge when the process is completed, and the charging-holes  $a'$  for introducing the fresh charge of green coal.

At or near the center of the oven, if the same is circular—or along or at intervals along its middle, if the oven is rectangular—I provide one or more vertical gas-exit pipes, C, of such height as will cause the top thereof to extend into the upper part of the coking-chamber and rise above any probable charge the oven will contain, and the floor  $c'$  I cause to slope in all directions from said pipe or exit-flue or from the center point or lines of the oven down to the several doors through which the coke is to be withdrawn. This construction facilitates the removal of the coke when the coking process is completed. This gas-exit flue C delivers into the combustion-chamber B, arranged immediately under the door of the coking-oven.

If the oven is circular, the combustion-chambers B will be formed by a series of concentric perforated walls,  $b$ ; but if the oven is rectangular, then a series of parallel broken walls,  $e$ , may be employed, and in either case a series of zigzag passages leading to the chimneys D will be obtained, which will prolong the travel of the burning gas below the coking-chamber, and thus insure its full heating effect.

$e'$  indicates flues or chambers extending from the outer walls of the oven, at the base thereof, into the combustion-chamber B, and serve a twofold purpose—first, as a means by which the inflammable gas escaping from the coking-chamber A through flue C may be ignited in the combustion flues or chambers B; and, secondly, as a means for supplying air to support the combustion in the said flues.

The construction being substantially of the character hereinbefore set forth, the oven may be operated as follows: The doors  $a$  having been closed and the coking-chamber A charged with the coal to be coked, the coal may be ignited above in the usual manner and the cok-



ing process allowed to proceed until inflammable gases begin to issue through the charging-ports *a'*. The charging-ports *a'* are then closed and the gases evolved from the charge caused to descend through vertical gas-exit C into combustion-chamber B, wherein they are ignited through ports *e*, and, receiving a proper supply of air, continue to burn in and traverse the zigzag flues immediately under the floor of the coking-chamber. As the upper layer of the charge is thus deprived of air and the heat is applied to the lower layer of the coal, the coking process will cease in the upper layer and set in or begin in the lower layer, and the coking process will then progress gradually from below upward, so that no tarry matter and imperfectly-coked mass will remain at the bottom of the charge, the gas evolved from the coking charge will be utilized, and but little loss will be sustained by the first step of the process or commencing the coking process by igniting the upper layer of the charge.

Another way to start the oven is by means of a gas or other flame introduced into the combustion-chamber B through one of the ports *e'*, for the preliminary firing, this being continued, and the charging-holes *a* being kept open until the gas from the charge becomes inflammable, when the ports *a'* may be closed, and the gas evolved will of its own accord de-

scend flue C, become ignited in the combustion-chamber B, and thenceforth continue to operate as hereinbefore specified.

Having thus set forth the nature, advantages, 35 and operation of my improved coking-oven, what I claim, and desire to secure by Letters Patent, is—

1. A coke-oven having a coking-chamber, a series of combustion-flues arranged immediately under the floor of the coking-chamber 40 so as to heat the same, and a vertical central downtake-flue leading from the upper part of the coking-chamber to the center of the combustion-chamber, substantially as and for the 45 purposes specified.

2. A coking-oven having a coking-chamber, a combustion-chamber arranged immediately under the coking-chamber so as to heat the same, and a central gas-exit flue which connects 50 the upper part of the coking-chamber with the combustion-chamber, the floor of the coking-chamber being inclined from the gas-exit flue to the discharge-doors of the coking-chamber, substantially as and for the purposes specified. 55

In testimony whereof I have affixed my signature, in presence of two witnesses, this 28th day of July, 1884.

HENRY M. PIERCE.

Witnesses:

R. W. BAGOT,  
STEWART CHURCH.