

No. 707,914.

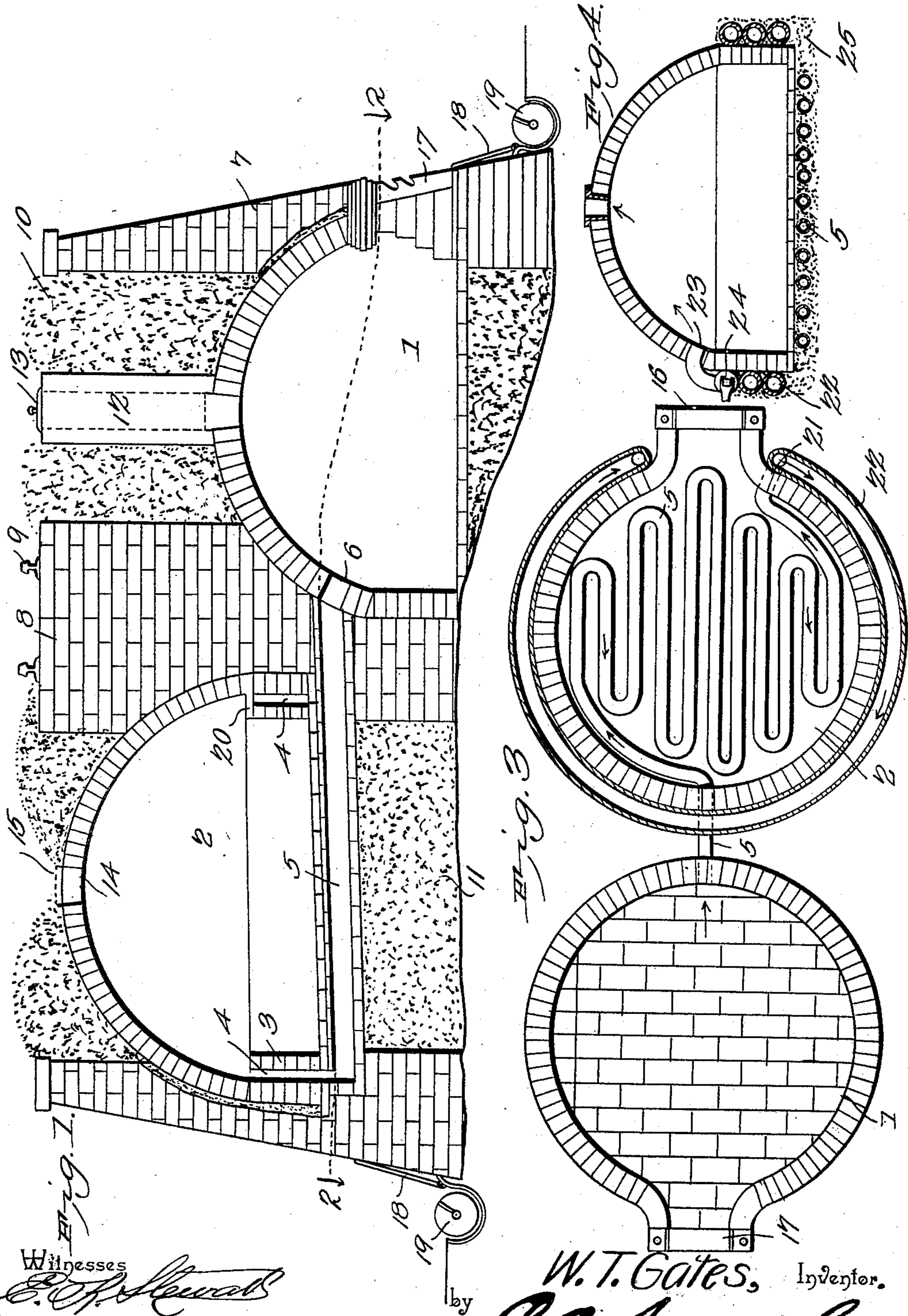
Patented Aug. 26, 1902.

W. T. GATES.  
COKE OVEN.

(Application filed Mar. 31, 1902.)

(No Model.)

2 Sheets—Sheet 1.



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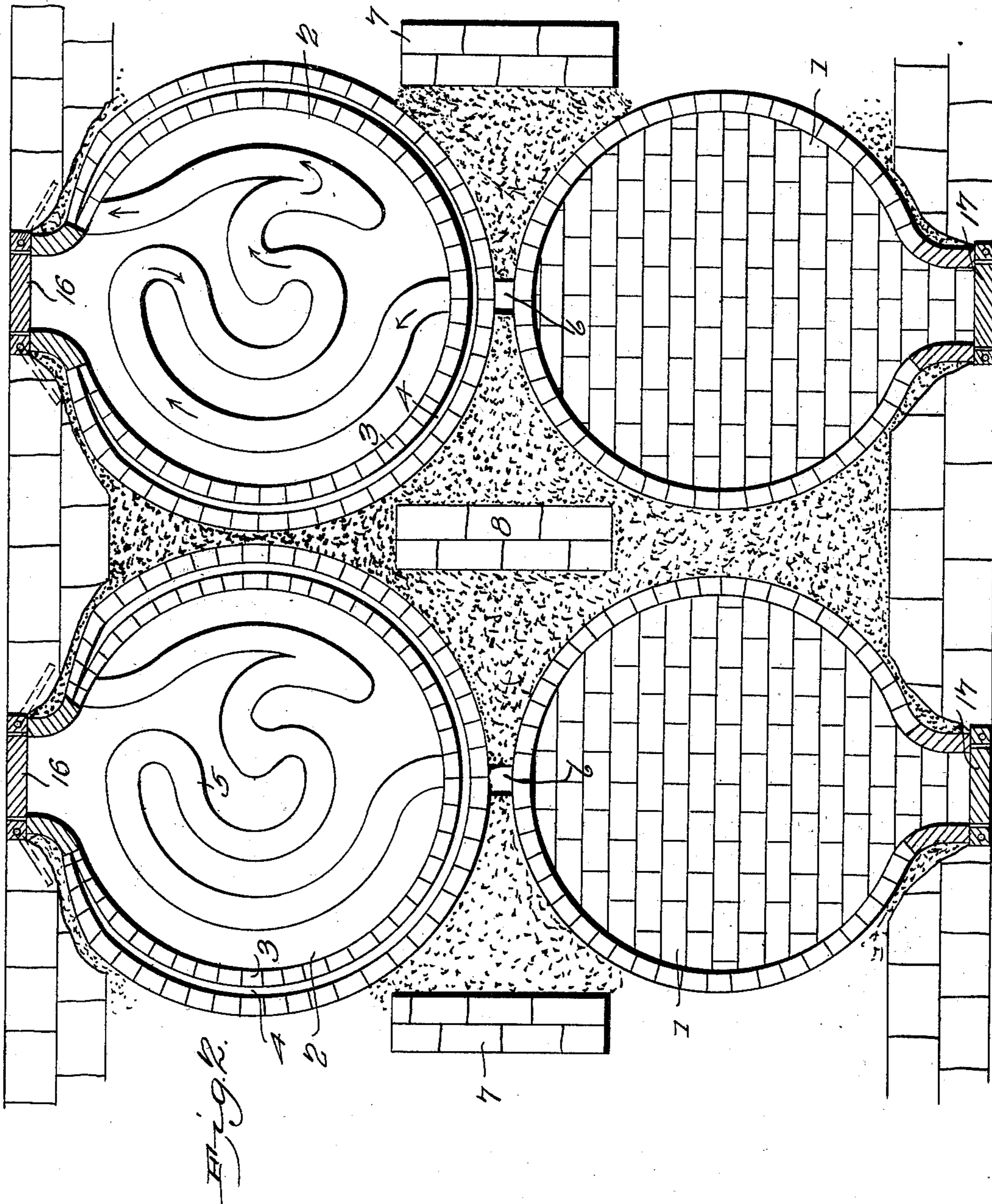
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# UNITED STATES PATENT OFFICE.

WILLIAM T. GATES, OF SIMPSON, WEST VIRGINIA.

## COKE-OVEN.

SPECIFICATION forming part of Letters Patent No. 707,914, dated August 26, 1902.

Application filed March 31, 1902. Serial No. 100,808. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM T. GATES, a citizen of the United States, residing at Simpson, in the county of Taylor and State of West Virginia, have invented a new and useful Coke-Oven, of which the following is a specification.

This invention relates generally to coke-ovens, and particularly to that class known as "bee-hive" ovens.

The object of the invention is in a ready, simple, thoroughly feasible, and practical manner to utilize the heat from the oven producing "furnace-coke" for doing effective work in the oven producing "foundry-coke."

A further object is to facilitate handling the finished coke.

With these and other objects in view, as will appear as the nature of the invention is better understood, the same consists, generally stated, in arranging the forty-eight-hour or furnace-coke-producing oven on a plane below that occupied by the seventy-two-hour or foundry-coke-producing oven and in directing the heat from the forty-eight-hour oven into and beneath the floor of the seventy-two-hour oven, and thence entirely around the lower portion of the side walls thereof. The improvements hereinafter described are equally adaptable to seventy-two-hour ovens having either single or double walls, the result being effected in the former case by providing externally-arranged flues around the lower portion of the oven to receive the heat from the forty-eight-hour oven and in the latter case by providing an internally-arranged flue between the walls of the lower portion of the oven.

The invention consists, further, in the novel construction and combination of parts of a coking-oven, as will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like numerals of reference indicate corresponding parts, there are illustrated two forms of embodiment of the invention, each capable of carrying the same into practical operation, it being understood that the elements therein exhibited may be varied or changed as to

shape, proportion, and exact manner of assemblage without departing from the spirit thereof, and in the drawings—

Figure 1 is a view in vertical transverse section through a coke-oven embodying the essential features of this invention. Fig. 2 is a view in horizontal section, taken on the line 2 2, Fig. 1, and looking in the direction of the arrow thereon. Fig. 3 is a view in horizontal section of a slightly-modified form of the apparatus. Fig. 4 is a transverse sectional view of a slightly-modified form of seventy-two-hour oven.

As is well known, ovens of this character are generally built with their floors disposed practically on the same plane. In building the ovens according to the present invention they are erected back to back in blocks, with their floors on different planes, as clearly shown in Fig. 2, wherein two of each of the ovens are exhibited, it being understood that this number may be increased at will and still be within the scope of the invention.

The forty-eight-hour or furnace-coke-producing oven 1 is of the usual or any preferred construction and has its floor disposed any desired distance below that of the seventy-two-hour or foundry-coke-producing oven 2, which latter may also be of the usual or any preferred construction. In the arrangement of this latter oven, as shown in Figs. 1 and 2, its lower wall is double, as at 3, and is spaced from the arch wall to present an annular flue 4, which communicates with a tortuous duct or flue 5, opening into the forty-eight-hour oven at any preferred height above its bottom, as at 6. These ovens are housed in suitable masonry, comprising battens 7, a larry-pillar 8, having the usual larry-tracks 9, and between the battens and the larry-pillar and beneath the floors of the ovens is interposed the usual filling 10 and 11. Aside from the particular improvements hereinafter pointed out, the exact construction of the ovens and their supporting masonry is immaterial and may be of any preferred style. The forty-eight-hour oven is provided with the usual charging-flue 12, closed by a damper or cover 13, and the seventy-two-hour oven is provided with a charging-flue 14, normally sealed by a closure

15. (Indicated by dotted lines in Fig. 1.) Each oven is also provided with a door 16 and 17, respectively, of the usual or any preferred construction, and with an apron 18, arranged immediately under the oven-door sills and constituting slides for directing the coke to conveyers 19, to which they are hinged, the conveyers being disposed entirely around the blocks to transport the coke to cars, furnaces, or to receiving-bins. The tortuous duct 5, connecting the forty-eight-hour oven with the seventy-two-hour oven, may be made of any suitable material capable of withstanding a high degree of heat, preferably of vitrified clay, and is to be disposed under the tile floor of the oven in such manner as to heat its entire area evenly, the duct to be either circular or square in cross-section, as may be preferred. The highly-heated products of combustion from the forty-eight-hour oven enter the duct 5, traverse the same, and escape into the flue 4 at the left-hand side of the door 16, thence around the flue and escape therefrom at the right-hand side of the said door, and thence into the oven. It will be understood, of course, that the points of entrance and escape of the products may be the reverse of that just described—that is to say, they may enter at the right-hand side of the door and escape at the left-hand side. The flue 4, except at its discharge end, is closed by a cap 20, clearly shown in Fig. 1, thereby to compel the heated products of combustion to traverse the entire circumference of the oven before escaping. Where the seventy-two-hour oven is constructed with a single wall, as shown in Figs. 3 and 4, the duct 5 is disposed in the same manner, or substantially so, as shown in Figs. 1 and 2; but its discharge end projects through the wall of the oven at 21 and is connected with a flue 22, that encircles the lower portion of the oven in as many coils as desired and enters the oven at 23, a valve 24, disposed on the flue adjacent to its point of connection with the oven, serving to control the passage of heated products thereto. To prevent radiation of heat from the flue 22, the same is embedded in a suitable filling 25. Whether the seventy-two-hour oven be heated internally only by the heated products of combustion from the forty-eight-hour oven, as shown in Figs. 1 and 2, or is internally and externally heated by said products, as shown in Fig. 3, the object sought is attained in a thoroughly practical and economical manner, and owing to the fact that products heretofore generally wasted are utilized for doing effective work it will be seen that a large saving in the production of coke of the characters specified will result.

It is to be understood that the invention is not to be limited to the precise construction and arrangement of the duct 5, as shown, nor to the exact point of location at which it is associated with the forty-eight-hour oven, as

it will be obvious that changes may be resorted to in carrying into effect these parts of the invention without departing from the spirit thereof.

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

1. An apparatus for producing different grades of coke comprising a plurality of ovens, and means for conveying the products of combustion from a point above the floor of an oven producing a lower grade of coke into and beneath the floor of an oven producing a higher grade of coke.

2. An apparatus for producing different grades of coke, comprising a plurality of ovens, and means for conveying the products of combustion from a point above the floor of an oven producing a lower grade of coke into and beneath the floor and around the sides of an oven producing a higher grade of coke.

3. An apparatus for producing different grades of coke, comprising a plurality of ovens, the floor of an oven producing a lower grade of coke being disposed below the plane of the floor of an oven producing a higher grade of coke, and means for conveying the products of combustion from the first-named to the last-named oven.

4. An apparatus for producing different grades of coke, comprising a plurality of ovens, and a tortuous duct for conveying the products of combustion from a point above the floor of an oven producing a lower grade of coke into and beneath the floor of an oven producing a higher grade of coke.

5. An apparatus for producing different grades of coke, comprising a plurality of ovens, a tortuous duct for conveying the products of combustion from a point above the floor of an oven producing a lower grade of coke into and beneath the floor of an oven producing a higher grade, and a flue communicating with the duct for conveying the said products around the walls of the last-named oven.

6. An apparatus for producing different grades of coke, comprising a plurality of ovens, a tortuous duct for conveying the products of combustion from a point above the floor of an oven producing a lower grade of coke into and beneath the floor of an oven producing a higher grade, and a flue communicating with the duct for conveying the said products around the interior wall of the last-named oven.

7. An apparatus for producing different grades of coke, comprising two ovens arranged back to back and having their floors arranged on different planes, a tortuous duct arranged beneath the floor of the higher oven and communicating with the lower oven at a point above its floor, and a flue communicating with the duct for conveying the said products around the wall of the higher oven.

8. An apparatus for producing different

grades of coke, comprising two ovens arranged  
back to back and having their floors arranged  
on different planes, and a tortuous duct ar-  
ranged beneath the floor of the higher oven  
5 and communicating with the lower oven at a  
point above its floor.

In testimony that I claim the foregoing as

my own I have hereto affixed my signature in  
the presence of two witnesses.

WILLIAM T. GATES.

Witnesses:

H. C. DAVIS,

B. F. RADABAUGH.