

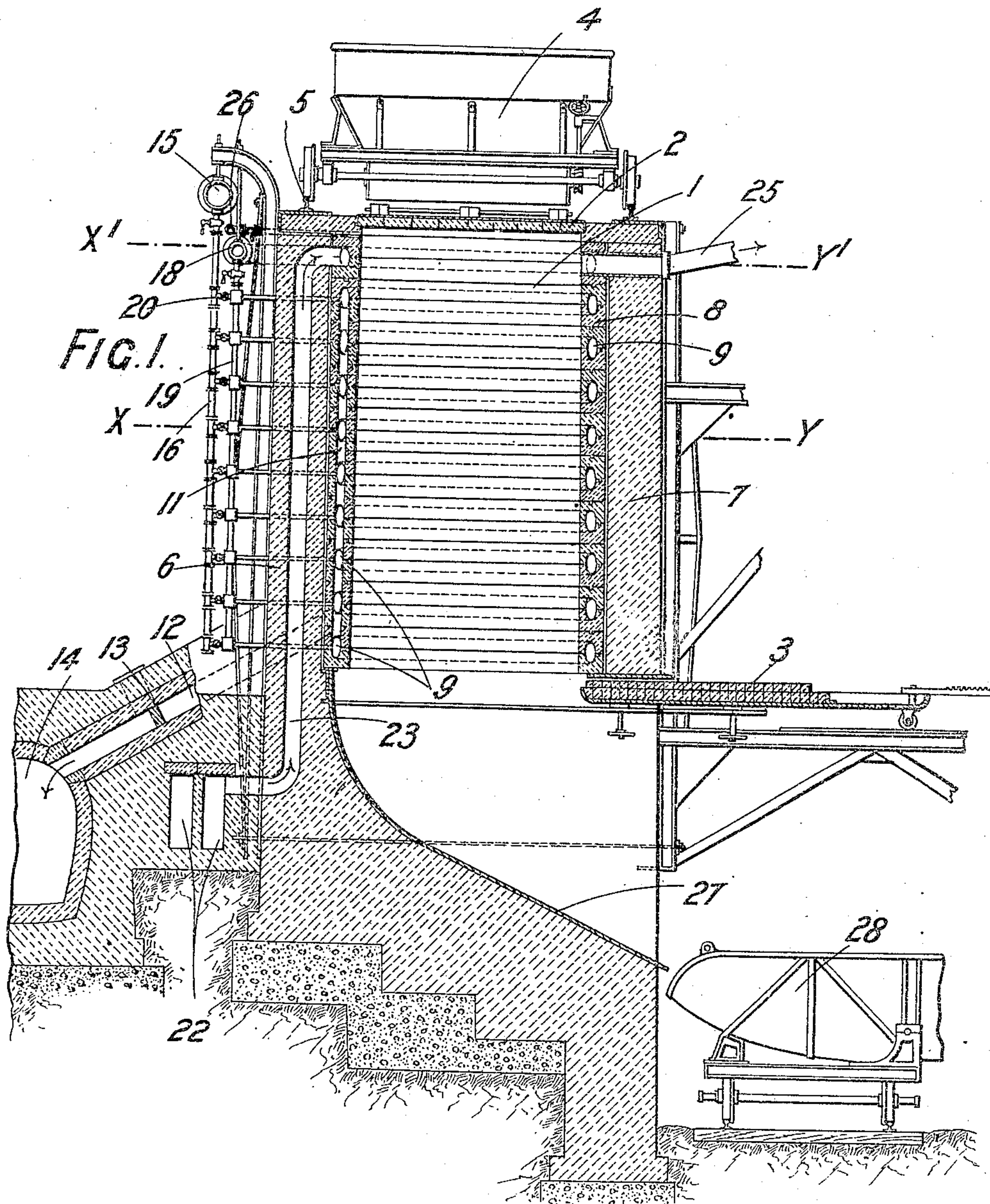
No. 875,436.

PATENTED DEC. 31, 1907.

A. O. JONES.
COKE OVEN.

APPLICATION FILED MAY 15, 1907.

3 SHEETS—SHEET 1.



Witnesses

Chas H. Smith
A. L. Serrell

Inventor

Arthur Owen Jones
per Harold Serrell
his atty.

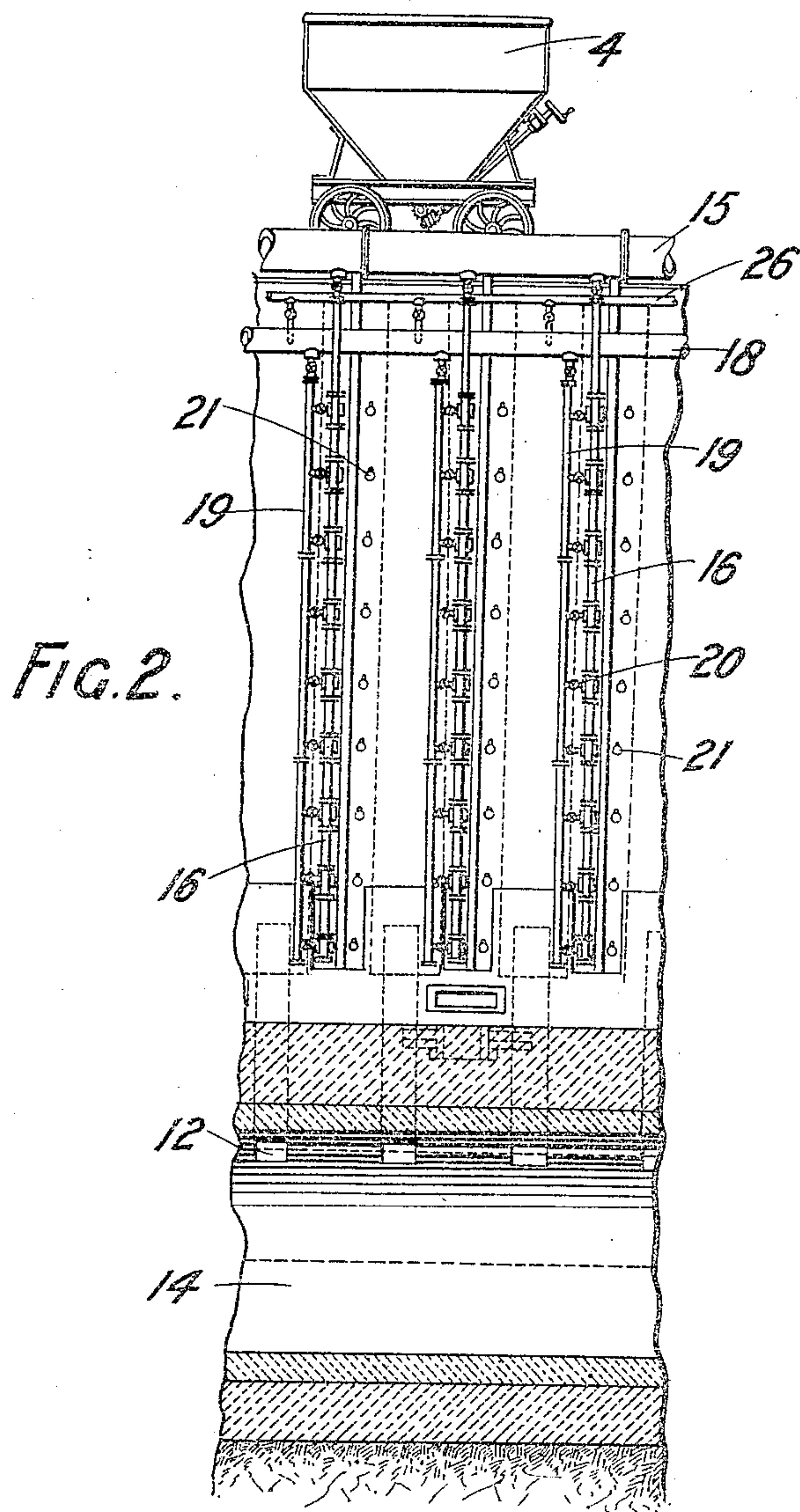
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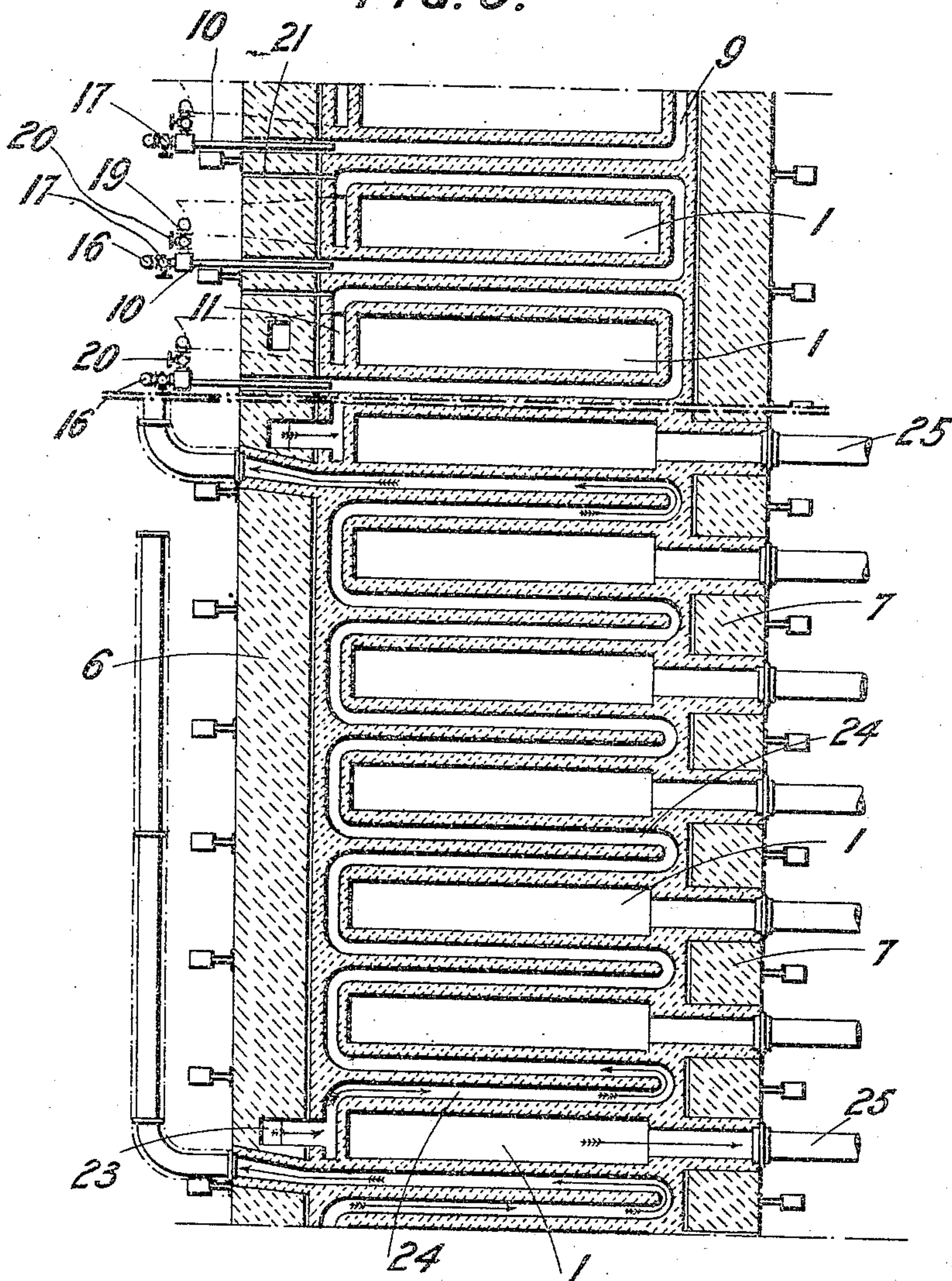
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3 SHEETS—SHEET 3.

FIG. 3.



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UNITED STATES PATENT OFFICE.

ARTHUR OWEN JONES, OF NEW BRANCEPETH, ENGLAND.

COKE-OVEN.

No. 875,436.

Specification of Letters Patent.

Patented Dec. 31, 1907.

Application filed May 15, 1907. Serial No. 373,721.

To all whom it may concern:

Be it known that I, ARTHUR OWEN JONES, a subject of the King of Great Britain, residing at New Brancepeth, in the county of Durham, England, have invented certain new and useful Improvements in Coke-Ovens, and of which the following is a specification.

This invention relates to that type of vertical coke ovens in which the material to be treated is charged through the top and removed through the base when coked, it having a removable sole to close the said base and having heating flues extending around the oven in horizontal planes.

The present invention relates to the construction and combination of parts composing the improved vertical coke ovens herein-after described and claimed, which can be charged at one operation with the material to be coked and without having to level the top of the material, while the horizontal heating flues surrounding such an oven are entirely separate from one another and each separately and controllably heated, and also all the separate horizontal flues of each oven open into a vertical outlet flue belonging to that particular oven, while the top part of each oven is prevented from becoming overheated by means of an air circulation passed around it through horizontal circuitous passages.

The invention will be fully understood by the following description with reference to the accompanying drawings which illustrate ovens constructed according to the present invention.

Figure 1 is a vertical cross section through one of the ovens in a "bank" or series. Fig. 2 is an elevation of a portion of the front wall of the series. Fig. 3 shows horizontal sections taken in two planes, the upper part of this figure being a section through the ovens and heating flues on the lines X, Y, of Fig. 1, and the lower part of Fig. 3 being a section on the line X', Y', of Fig. 1 showing the circuitous air passages.

Each vertical oven 1 is rectangular and oblong in plan as shown at Fig. 3, of considerable length in proportion to its width, and the charging opening at the top of each oven is of the full size of the oven, and is fitted with a hinged or other cover 2 wholly removable, and the base of each oven is capable of being closed by means of a sliding sole plate 3, carried in guides and operated by any suitable means, being generally made to slide be-

neath the oven, and then to be raised, by means of screws or other devices, into contact with the under-surface of the oven.

A hopper wagon 4 is capable of being traversed upon rails 5 mounted upon the front and rear walls 6, 7, of the series of ovens, outside the fireclay lining 8 thereof, and the size of the opening of the wagon for discharging its contents is equal to the full open top of each oven. Since the wagon is made to contain a full charge for an oven, it will be clear that when it is brought over the full open top of an oven and the hopper is opened, that oven will receive instantaneously a complete charge, and owing to the narrow oblong form of the ovens in plan, the inclines of the top surface of the charge will not present such angles as to call for any leveling of that charge.

The separate horizontal heating flues 9 (Figs. 1 and 3) are constructed in the fireclay lining of each oven, and entering each flue from the front of the oven (see Fig. 3) is a burner 10 through which the combustible mixture of air and gas is projected down one side of an oven, passes along the back, along the other side, and over the front, and the front ends of each of the horizontal flues of an oven communicate with a common vertical outlet passage 11 for that oven. Each of these common outlet passages 11 has a channel 12 (see Fig. 1) controlled by a damper 13, the channels 12 all leading into an uptake flue 14 common to the whole series of ovens.

The burners 10 are supplied with gas—obtained as usual from the product being treated—by means of a gas main 15 and branch pipes 16 to which each burner is connected, the admittance of gas from the branches 16 to each burner being controlled by valves 17. Heated air is also supplied to the burners from a main pipe 18 and branch pipes 19, the connections between the branch pipes and the burners being also controllable by means of valves 20.

21 are sight apertures.

Circuitous passages 22 are formed in the base of the ovens. Into these passages air is admitted, and circulating therethrough, passes up vertical passages 23, formed at intervals in the front wall of the bank of ovens. The vertical passages 23 communicate at their upper ends with circuitous horizontal passages 24 formed in the lining of the ovens near the tops of the same as shown at Fig. 3, and circulating through these pas-

sages, the air is finally conducted to the heated air supply mains 18 (Fig. 1). The air passing through the passages 24, while thus becoming heated, has a cooling action upon the tops of the ovens, that is, it has a cooling effect sufficient to prevent the tops of the ovens becoming too highly heated and thereby bringing about the decomposition of the gases evolved from the material being coked.

Pipes 25 are provided for taking off the gases from the tops of the ovens evolved during coking, and these gases are passed through ordinary by-product recovery apparatus as is common, and are subsequently led to the gas supply main 15.

To still further prevent decomposition of the gases evolved, steam from a pipe 26 can be admitted to the upper portions of the ovens by branch pipes. The coked product is automatically discharged by gravity upon the withdrawal of the sole 3, and falls onto an inclined hearth 27 which directs it into trucks 28.

I claim as my invention:

1. In vertical coke ovens of that type in which the material treated is charged through the top and removed, when coked, through the base, the combination of a series of such ovens, each oblong in plan and of great length in proportion to its width, having a full open top, having a series of heating flues in the walls thereof, extending in horizontal planes around each oven, and having a vertical outlet passage in said walls for each oven with which outlet passage all said horizontal heating flues of said oven communicate, means for supplying heating gas and air separately to said heating flues and means for controlling said supply to each flue, a removable cover for closing the full open top of each oven, a removable sole for closing the base thereof, and rails mounted on the side walls of said series of ovens beyond the fireclay lining thereof to support a wagon having a hopper opening corresponding to the length of the open top of said ovens, substantially as set forth.

2. In vertical coke ovens of that type in which the material treated is charged through the top and removed, when coked, through the base, the combination of a series of such ovens, each oblong in plan and of great length in proportion to its width, having a full open top, having vertical outlet passages in the front wall of the series, one for each oven, and having a series of heating flues in said walls extending in horizontal planes around each oven, each of said flues being separate from the next flue above or below it, all the horizontal flues around one oven communicating with said vertical outlet passage for that oven in the front wall of the series, each of said horizontal heating flues extending from said vertical outlet passage

around said oven and opening to the exterior of the front wall of the series of ovens, a gas and air admittance pipe entering the opening of each horizontal flue in the front wall and means for controlling each of said pipes, a removable cover for closing the full open top of each oven, a removable sole for closing the base thereof, and rails mounted on the front and rear walls of said series of ovens beyond the fireclay lining thereof to support a wagon having a hopper opening corresponding to the length of the open tops of said ovens, substantially as set forth.

3. In vertical coke ovens of that type in which the material treated is charged through the top and removed when coked, through the base, the combination with a series of such ovens, each oblong in plan and of great length in proportion to its width, having a full open top, having a series of separate heating flues in the walls thereof extending in horizontal planes around each oven, having a vertical outlet passage in said walls for each oven with which outlet passage all said horizontal flues of said oven communicate, said walls having vertical air admittance passages, communicating with circuitous air passages extending horizontally at the top of and continuously around several ovens, and having a delivery passage for said air, a heated air supply main and a pipe to conduct the heated air from said delivery passage to said main; of a removable cover for closing the full open top of each oven, a removable sole for closing the base thereof, rails mounted on the side walls of said series of ovens beyond the fireclay lining thereof to support a wagon having a hopper opening corresponding to the length of the open top of said ovens, means for supplying heating gas and air separately to said heating flues, and means for controlling said supply to each flue, substantially as set forth.

4. In vertical coke ovens of that type in which the material treated is charged through the top and removed when coked, through the base, the combination with a series of such ovens, each oblong in plan and of great length in proportion to its width, having a full open top, having vertical outlet passages in the front wall of the series one for each oven, and having a series of heating flues in said walls extending in horizontal planes around each oven, each of said flues being separated from the next flue above or below it, all the horizontal flues around one oven communicating with said vertical outlet passage for that oven in the front wall of the series, each of said horizontal heating flues extending from said vertical outlet passage around said oven and opening to the exterior of the front wall of the series of ovens, and a gas and air admittance pipe entering the opening of each horizontal flue in the front wall, and means for controlling each of said pipes, of a removable cover for

closing the full open top of each oven, a removable sole for closing the base thereof, rails mounted on the front and rear walls of said series of ovens beyond the fireclay lining thereof to support a feed wagon, said walls of the series of ovens having vertical air admittance passages communicating with circuitous air passages extending horizontally at the top of and continuously around several ovens for cooling the tops of said ovens and for heating the air passed therethrough, and having a delivery passage for said air, a

heated air supply main containing the heated air to be supplied for combustion, and a pipe to conduct the heated air from said delivery passage to said main, substantially as set forth. 15

In witness whereof I have hereunto set my hand in the presence of two witnesses.

ARTHUR OWEN JONES.

Witnesses:

WILLIAM FORSTER KIPPING,
WALTER W. TAYLOR.