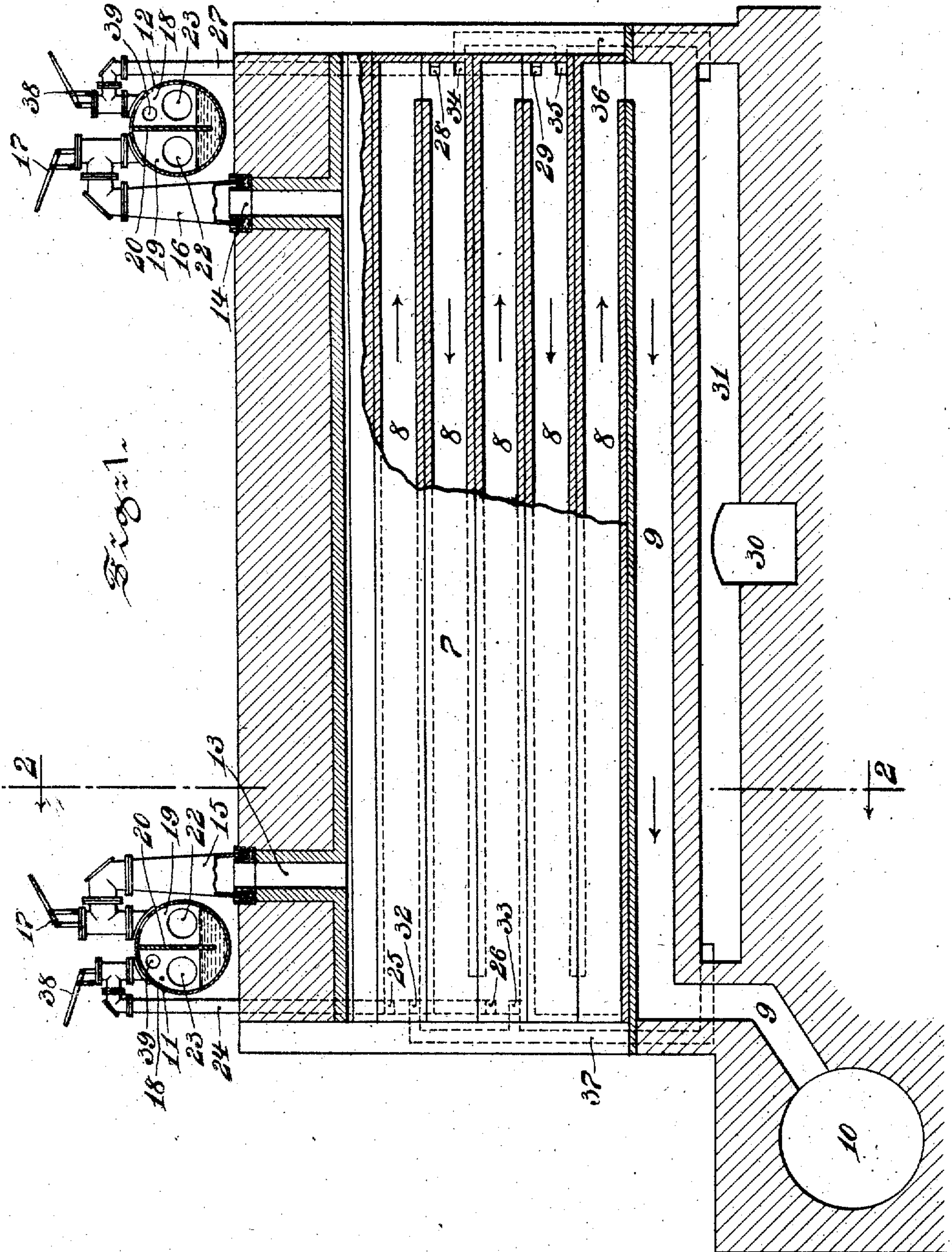


W. H. BLAUVELT.
COKE OVEN.
APPLICATION FILED MAR. 29, 1908.

963,681.

Patented July 5, 1910.

2 SHEETS—SHEET 1.



Witnesses:
Mac Hofmann
Jas. C. Kobusmith

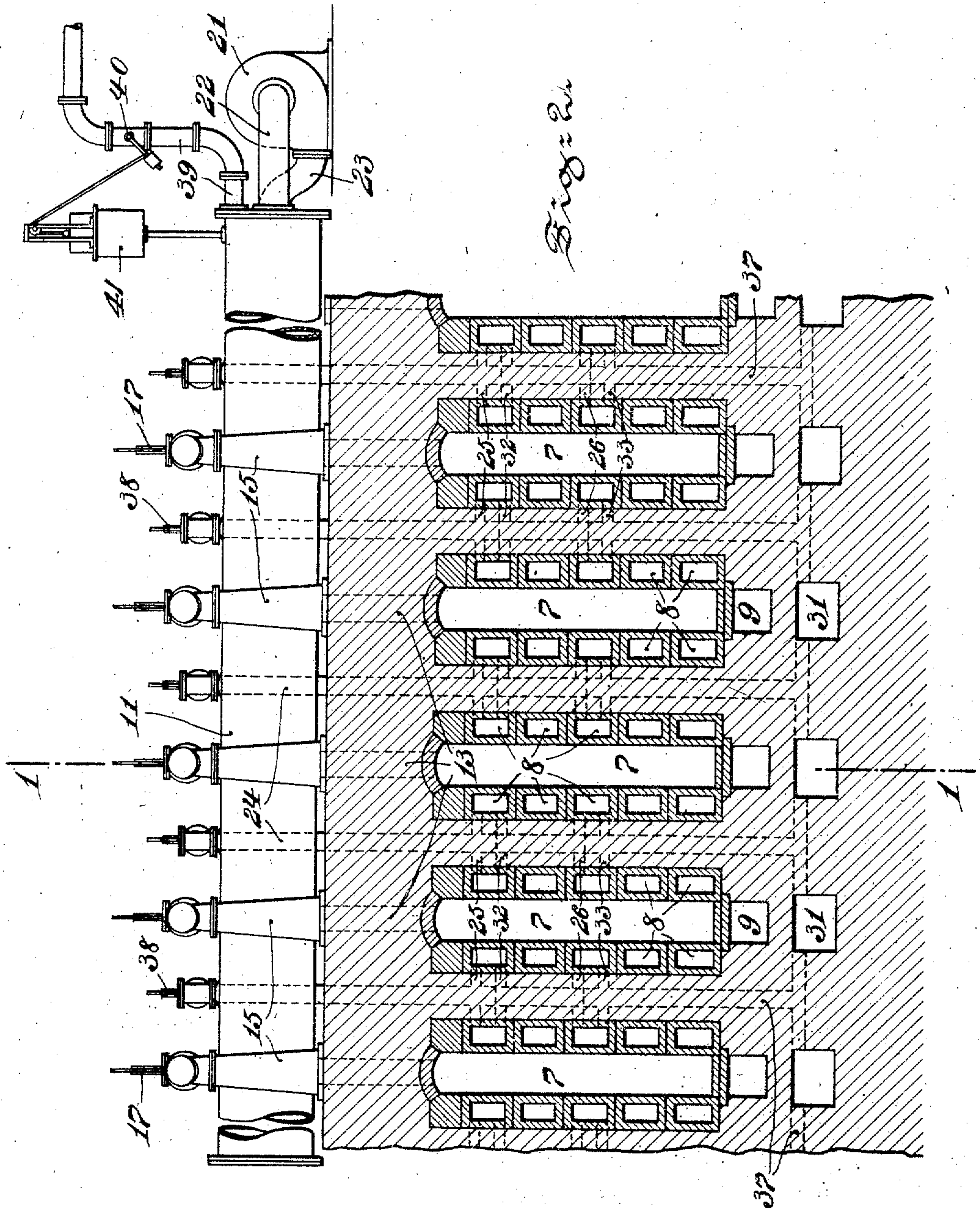
Inventor:
William H. Blauvelt
By J. W. Wardale
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Witnesses:
Max Hofmann
Jas. C. Holmsmith

Inventor:
William H. Blauvelt
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UNITED STATES PATENT OFFICE.

WILLIAM H. BLAUVELT, OF SYRACUSE, NEW YORK.

COKE-OVEN.

963,681.

Specification of Letters Patent.

Patented July 5, 1910.

Application filed March 29, 1906. Serial No. 308,638.

To all whom it may concern:

Be it known that I, WILLIAM H. BLAUVELT, a citizen of the United States, residing at Syracuse, in the county of Onondaga and State of New York, have invented a new and useful Coke-Oven, of which the following is a specification.

My invention relates to improvements in coke ovens.

10 The object of my invention is to provide improved means in connection with a retort oven for the production of coke whereby the gas produced in the coking process shall be utilized in furnishing heat to the retort.

15 In connection with retort coke ovens means are usually provided whereby the distillations from the coal during the coking process are recovered and utilized in the form of tar, ammonia, gas, etc. Where
20 however, the available coal contains only small percentages of by-products, or where market conditions are adverse, the recovery of by-products from the coal during the coking process may not be profitable. In such
25 a case it may be desirable to utilize the whole, or a portion of the gas resulting from the coking process, for furnishing heat to the retorts without treating it for the by-products, thereby simplifying the operation.

30 It is the object of my invention to provide means whereby the gases produced from the coking of such coals shall be utilized with the greatest economy and efficiency to furnish the required heat for the coking process,
35 and at the same time to maintain a suitable pressure in the retorts.

My invention also comprises means for the even distribution of the gas at required pressure in the flues, irrespective of the
40 pressure in the retorts, so that the retorts, by the combustion of the gas in the combustion flues, shall be maintained at an even and properly distributed temperature.

My invention also comprises means in connection with a plurality of retorts, for collecting and mixing the gas from the several retorts, and distributing it to the combustion flues approximate said retorts, and at the same time controlling the pressure in the
50 retorts and also at the burners. It is to be understood that these retort coke ovens are built in blocks usually of about thirty or fifty retorts. These retorts being all oper-

ated together, it follows that the different retorts are in relatively different stages of coking process, and consequently giving off gases respectively varying in quantity and quality.

During the earlier stages of the coking process a greater amount of gas is distilled and the gas is richer in quality, while toward the latter stages of the coking of a charge of coal the gas given off is poor in quality and less in quantity. It is also to be noted that in the several stages of the coking process it is desirable at one time that more heat and at another time less heat should be communicated to a retort. My invention comprises means for accumulating all these gases, mingling the same to maintain a substantially constant standard of quantity and quality, maintaining the same at a required or constant pressure with respect to the retorts, and delivering gas from this common supply to such points or gas burner vents in the combustion flues of the various retorts and at such pressure, independent of the pressure of the retorts, as may be necessary to secure the best results in the coking process.

My invention is equally adapted to retort ovens of the horizontal flue type or to vertical flue ovens.

The following description explains the application of my invention, for example, to retort ovens having horizontal heating flues.

Referring to the drawings:—Figure 1 is a longitudinal vertical section on line 1—1 of Fig. 2, with portions broken away to show the flues. Fig. 2 is a vertical cross-section on line 2—2, of Fig. 1.

Similar numerals refer to similar parts throughout the several views.

The retorts 7 are usually built in blocks or groups of thirty to fifty, or more or less. They are provided with a series of laterally disposed horizontal flues connecting at alternate ends so that a zigzag draft is maintained through the flues from the top of the retort to the bottom thereof, the products of combustion being carried through channels 9 and 10 to the stack. The gas mains 11 and 12 are provided at either end of the retorts and extend across the entire battery of said retorts. Each retort opens through

the top into the channel 13 at one end and channel 14 at the other end. These channels deliver through conductors 15 and 16 respectively to the mains 11 and 12. Communication between each retort and the main is controlled by the ordinary valve 17. It will thus be seen that all the retorts that are generating gas will be discharging at each end into the mains 11 and 12. It is to be noted that mains 11 and 12 are divided into two compartments 18 and 19 by the partition 20 extending from the top of the main and dipping into a water seal near the bottom. The construction is such that the gas discharges from the retorts into the collecting compartment 19. A blower 21 is provided as shown in Fig. 2, to draw the gas from collecting compartment 19 through pipe 22 and deliver it through pipe 23 into distributing compartment 18. This blower may be driven by any suitable means, which may be provided with means, automatic or otherwise, for varying or regulating its speed, so as to maintain the desired pressure of gas in collecting compartment 19, and consequently the desired pressure of gas in the retorts.

To the distributing compartment 18 is connected a bleeder or pipe 39 leading any surplus gas off to boilers or other points of consumption. This bleeder is controlled by the valve 40. The automatic pressure device as shown at 41, Fig. 2, is adapted to actuate valve 40 so as to automatically control at all times, the pressure in the distributing main. Adjustment or regulation, as to the pressure to be maintained in compartment 18, may be secured, for example, by moving the weight on the end of arm connected with valve 40, as shown in Fig. 2.

Compartment 18 of main 11 is adapted to discharge through pipe 24 and discharge at burner openings 25 and 26, in flues 8 at the end of the retort. Pipe 27 will in a similar manner lead the gas from the chamber 18 of main 12 to burner vents 28 and 29 in flues 8 at the other end of the retort. By this means is secured a discharge of gas from reservoirs 11 and 12 at the beginning of several of the horizontal flue sections following the direction of the arrows in Fig. 1. The burner vents or openings 25, 26, 28 and 29 are controlled by any suitable form of valve or gate to regulate the amount of gas permitted to flow there-through.

Through the channel or conduit 30 air is conducted to the channels 31 extending horizontally beneath the retorts. From channels 31 extend leads 36 and 37 in the masonry or brick work of the oven structure to vents 32, 33, 34 and 35, approximate and slightly below the gas vents 25, 26, 28 and 29 respectively, to sustain the combus-

tion of the gases therefrom. The air passing through channels 30, 31 and leads 36 and 37 obviously becomes thoroughly heated before discharging into the flues. The vents 32, 33, 34 and 35 are similarly controlled by suitable valves for varying the amount of air supply to the flues. The passage of gas from compartment 18 of mains 11 and 12 is controlled by valve 38 similar to valve 17.

The operation of my device is as follows:—For an efficient operation of the oven it is necessary to control the pressure in the retorts so as to maintain same at approximately atmospheric pressure. Since these retorts are built of fire brick, any pressure substantially above atmosphere would cause a leak of the gases through the walls of the retort, resulting not only in waste of the gas but also in irregular and uncontrollable heat in the adjacent flues. It is necessary, in order to maintain an approximately atmospheric pressure in the retorts, that the conductors leading from the retorts, or the receiver connected therewith, should be maintained at a negative or below atmospheric pressure to overcome friction conditions which would tend to obstruct or impede the flow of gas from the retorts, and thereby create a positive or above atmospheric pressure in the retorts. On the other hand it is necessary that the pressure of gas at the burners be maintained at a positive or above atmospheric pressure, for example a pressure equal to four inches of water, in order to secure an efficient burning of the gas in the flues. It is obvious that the pressure of the gas at the burners must therefore be greater than the pressure of gas in the retorts. For this reason some means must be provided, as for example the blower 21, and the valve 40 and pressure regulator 41 to control the pressure in the retorts and also the pressure at the burners, and so as to secure a positive pressure of gas at the burners, independent of the pressure of the retorts.

Claims:—

1. In a non-recovery retort coke oven, the combination of a plurality of retorts, combustion flues adjacent thereto provided with gas burners, a collecting chamber connected with the retorts, a distributing chamber connected with the burners, means for transmitting gas from the collecting chamber directly to the distributing chamber, means for controlling the pressure in the collecting chamber and thereby the pressure in the retorts, and means for controlling the pressure in the distributing chamber independent of the pressure in the collecting chamber, whereby the gas, some rich and abundant from some of the retorts and some poor and scanty from other retorts is permitted

to mix and become of uniform quality when delivered to the burners, and whereby the pressure at the burners is controlled to secure effective control of the heats in the combustion flues.

2. In a non-recovery retort coke oven, the combination of a plurality of retorts, combustion flues adjacent thereto provided with gas burners, a gas receiving chamber connected directly with the retorts, a gas distributing chamber connected directly with the burners, means connecting the receiving chamber directly with the distributing chamber, pressure controlling means connected with the receiving chamber, and pressure controlling means connected with the distributing chamber, whereby the gases from the retorts varying in richness and quantity are mixed and delivered at required pressure to the burners, and whereby the required pressure is maintained in the retort.

3. In a retort coke oven, the combination of a plurality of retorts, flues adjacent thereto provided with gas burners, a main divided into a receiving compartment and a discharging compartment, means for connecting the receiving compartment with the several retorts, means for connecting the discharging compartment with the burners, and means for delivering gas from the receiving compartment to the discharging compartment at a required pressure.

4. In a retort coke oven, the combination of a plurality of retorts, flues adjacent thereto provided with gas burners, a main divided into a receiving compartment and a discharging compartment, means connecting the receiving compartment with the several retorts, means for connecting the discharging compartment with the burners, and means for delivering gas from the receiving compartment to the discharging compartment, said receiving compartment being of such capacity relatively to the retorts as to secure an efficient mixing of the gases received from the said several retorts.

5. In a retort coke oven, the combination of a plurality of retorts, flues adjacent thereto provided with gas burners, a main divided into a receiving compartment and a discharging compartment, means for connecting the receiving compartment with the several retorts, means for connecting the discharging compartment with the burners, and means for delivering gas from the receiving compartment to the discharging compartment at a required pressure, said compartments being of such relative capacity as to secure an efficient mixing of the gas received from the several retorts.

6. In a retort coke oven, the combination of a plurality of retorts, flues adjacent thereto provided with gas burners, a main divided into a receiving compartment and a discharg-

ing compartment, means for connecting the receiving compartment with the several retorts, means for connecting the discharging compartment with the burners, and a conductor and blower connected therewith as means for delivering gas from the receiving compartment to the discharging compartment at a required pressure.

7. In a retort coke oven, the combination of a plurality of retorts, flues adjacent thereto provided with gas burners, a main divided into a receiving compartment and a discharging compartment, means for connecting the receiving compartment with the several retorts, means for connecting the discharging compartment with the burners, means for delivering gas from the receiving compartment to the discharging compartment at a required pressure, and an automatically controlled valve for relieving excessive pressure in the discharging compartment.

8. In a retort coke oven, the combination of a plurality of retorts, flues adjacent thereto provided with gas burners, a main divided into a receiving compartment and a discharging compartment, means for connecting the receiving compartment with the several retorts, means for connecting the discharging compartment with the burners, means for delivering gas from the receiving compartment to the discharging compartment at a required pressure, and an escape valve and a pressure regulator for controlling the same connected with the discharging compartment.

9. In a retort coke oven, the combination of a plurality of retorts, a gas main extending across the series of retorts and above the same, said main divided into two longitudinally extending compartments, conductors leading from the several retorts to one of said compartments, means for delivering the gas from the said receiving compartment into the other compartment at a required pressure, and conductors leading from the latter or discharge compartment to the retort flues, whereby the gas, some rich and abundant from some of the retorts and some poor and scanty from other retorts, is permitted to mix and become of uniform quality and then discharged, at the required pressure, to the retort flues.

10. In a retort coke oven, the combination of a plurality of retorts, a gas main extending across the retorts, said main divided into two longitudinally extending compartments by a partition having a longitudinal vertical extension from the top of the main toward the bottom thereof, and a liquid seal co-operating therewith, conductors leading from the several retorts to one of said compartments for carrying the gas, as it is discharged from the several retorts in varying quantities and qualities, to the common com-

partment or receptacle, means for delivering the gas from the said receiving compartment into the other compartment at a required pressure, and conductors leading from the
5 latter or discharge compartment to the retort flues, whereby the gas, some rich and abundant from some of the retorts and some poor and scanty from other retorts, is per-

mitted to mix and become of uniform quality, and then discharged, at the required pressure, to the retort flues.

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Witnesses:

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EUGENE SIEGLER.