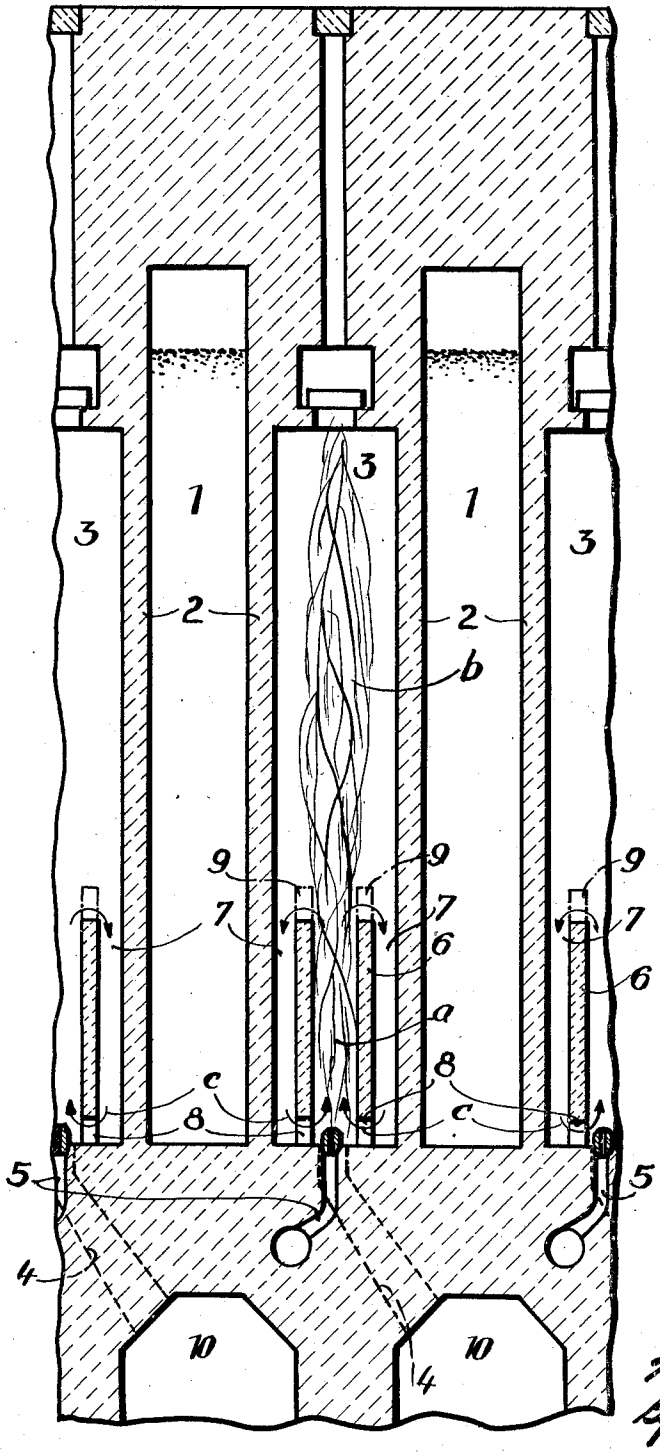
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CHAMBER OVEN FOR THE PRODUCTION OF GAS AND COKE

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CHAMBER OVEN FOR THE PRODUCTION OF GAS AND COKE

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1 Claim. (Cl. 202—151)

The present invention relates to chamber ovens for the production of gas and coke in which vertical heating flues are arranged in the chamber walls for heating by the combustion of gas and air in the heating flues, and in which part of the waste gases thereby produced are added to the heating media in order to improve the heating efficiency.

It is already known that by the addition of waste gas to the heating media, the length of flame may be increased considerably. The admixture of waste gas, especially for the heating of coke ovens equipped with vertical heating flues, has attained much practical importance since in this way it is possible to heat the very high walls of modern coke ovens in a uniform manner.

Now, the main object of my present invention is to provide such improvements in the heating of coke ovens equipped with vertical heating flues as will permit a recirculation of part of the waste gases in a new and very simple manner without interfering with the well experienced general design of the oven and arrangement of heating flues respectively.

My invention principally consists in providing in the lower part of the vertical heating flues of the coke oven, vertical ducts which are formed by cross walls or partitions extending parallel to the stretcher walls at both sides of the gas and air ports provided in the central plane of the bottoms of the heating flues, said vertical ducts being enclosed outside by the stretcher wall and inside by said cross partitions and being connected at the top and at the bottom with the free space serving as the combustion chamber between the cross partitions in such a manner that part of the combustion gases may be drawn into these ducts at their upper end, then they flow downwards inside said ducts and finally pass through the lower connecting opening into the lower part of the combustion chamber, thereby mixing with the heating media introduced thereinto.

The invention offers the possibility of effecting the admixture of waste gases to the heating media in the most simple way in coke ovens equipped with vertical heating flues of every kind. This is of considerable importance from a technical point of view since up to now it was possible to adopt the waste gas admixing principle for only the so-called twin-flue or hair-pin coke ovens in which the vertical heating flues are interconnected in pairs and the combustion media are introduced alternatively into one of the two heating flues of the heating flue pair and part of the waste gas flows through a lower connecting opening from the non-flame heating flue into the flame heated one.

According to this invention it is now also possible even with coke ovens of which the heating flues are fired in groups, or of which a whole heating flue series is fired simultaneously to heat them by the combustion of gas and air with the admixture of hot waste gases. The progress attained by this invention is obvious, particularly with regard to the continuously operated vertical chamber or retort ovens, since in this case the vertical heating flues are of such great height that the uniform heating of the wall is rendered difficult. By the admixture of waste gas a lengthening of the flame is arrived at so that the heating wall may be properly heated in the desired manner.

With the above and other objects and features of my present invention in view, I shall now describe by way of example an embodiment thereof on the lines of the accompanying drawing.

On the drawing there is shown how the invention may be applied to regenerative horizontal chamber or retort coke ovens provided with vertical heating flues. For simplicity's sake there is shown a vertical section of only a part of such regenerative coke oven, since the general design of the coke oven may be of any suitable type known to all those skilled in the art.

The coke oven or coke oven battery may be provided with a series of coke oven chambers 1 formed by the walls 2 built of refractory brickwork. In this specification, such walls 2 will be called stretcher walls. The stretcher walls are arranged in pairs and interconnected by a row of parallel vertical header walls 3 so that between the adjacent stretcher walls, a series of heating flues are formed.

The heating flues serve for the combustion of fuel gas and air and by such combustion, the stretcher walls 2 are heated to such a temperature that the cold charge in the coking chamber is carbonized.

Below the level of the sole of the coking chambers and heating flues respectively, a series of regenerator chambers 10 are provided in the substructure of the oven battery, said regenerator chambers serving for heating either the combustion air, or both the air and fuel gas, as is usual for the heating of coke ovens with lean gas, such as producer or blast furnace gas. The ovens may be operated in the manner well known to those skilled in the art.

Each heating flue is provided below with a regenerator duct 4 for inflow of the combustion air and with a rich gas duct 5 for the supply of non-regenerative preheated rich fuel gas. The ducts 4 and 5 terminate as close as possible into the central plane of the bottom of the heating wall, and may also be disposed side by side in the longitudinal direction of the heating wall contrary to the design illustrated on the accompanying drawing.

In the lower part of the heating flues and parallel to the stretcher walls 2 there are arranged vertical partitions 6 which extend from one vertical header wall 3 to the next vertical header wall 3 lying opposite. Between the partitions 6 and the stretcher walls 2 are disposed vertical channels or ducts 7 which are connected at their tops with the heating flue and which terminate at their bottoms in an aperture 8 leading into the combustion chamber marked *a* on the drawing.

If heating gas and air are introduced at the bottom of the heating flue, a flame is formed as indicated for instance at *b* on the drawing. Due to the strong buoyancy occurring in the combustion chamber *a*, a slight pressure below atmospheric is produced whereby waste gas may flow through the ducts 7 into the combustion chamber *a* corresponding to the arrows marked *c* on the drawing. The waste gas mixes with the heating media so that the flame *b* is most advantageously lengthened. The height of the partition wall 6 within the heating flues depends in each case upon the temperature necessary in the lower part of the heating wall. Under certain conditions it is also feasible to put extension bricks upon the upper edge of the cross walls 7 as indicated at 9 whereby the flow of the waste gases through the channels 7, and its temperature, may be controlled.

Furthermore it is advisable to install regulating means in mouths of the ducts 4 and 5 in order to alter the flow therefrom past the apertures 8 on entering the flue, to govern the pressure conditions in the heating flue in such a manner that the desired waste gas circulation through the channels 7 is arrived at.

The present invention may be applied to horizontal chamber or retort ovens as to vertical or inclined chamber or retort ovens for the production of gas and coke or the like. Furthermore this invention can likewise be adopted most advantageously in connection with other regeneratively heated ovens and furthermore with those ovens which are operated without changing the direction of heating.

I have now above described my present invention on the lines of a preferred embodiment thereof, but my invention is not limited in all its aspects to the mode of carrying it out as described and shown, since the invention may be variously embodied within the scope of the following claim.

I claim:

Chamber or retort oven for the production of gas and coke comprising: oppositely disposed stretcher walls forming the side faces of oven chambers, said stretcher walls being spaced from each other and interconnected by parallel vertical header walls which are also spaced from each other to form with the stretcher walls vertical combustion flues for upflow of flame of combustion of gas and air in direct contact with the stretcher walls; fuel gas and air inlet ports in the central plane of the bottoms of the vertical combustion flues; waste gas outlet means at the upper ends of said flues; and vertical recirculation ducts for adding part of the waste gases of combustion to the heating media introduced by the fuel gas and air inlet ports, each of said recirculation ducts being constituted of a short vertical partition disposed in a vertical plane of its heating flue so as to be interposed between the vertical planes of one of the stretcher walls and the fuel gas and air inlet ports, and being arranged therein so as to extend parallel to but only part-way up the lower half of the stretcher wall from adjacent the fuel gas and air inlet ports at the bottom of the combustion flue, each of said short partitions being spaced from its stretcher wall leaving the duct therebetween, and each said duct being connected at its upper part with its combustion flue at a level above the fuel gas and air inlet ports, so as to receive combustion products therefrom and being connected at its lower port with its combustion flue at the level of the gas and air inlet ports, so as to discharge the combustion products into the paths of flow from the fuel gas and air inlet ports.

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