Oct. 11, 1932. F. TOTZEK 1,882,553

CHAMBER OVEN FOR THE PRODUCTION OF GAS AND COKE

Filed Jan. 16, 1931 2 Sheets-Sheet 1

Fig. 1.

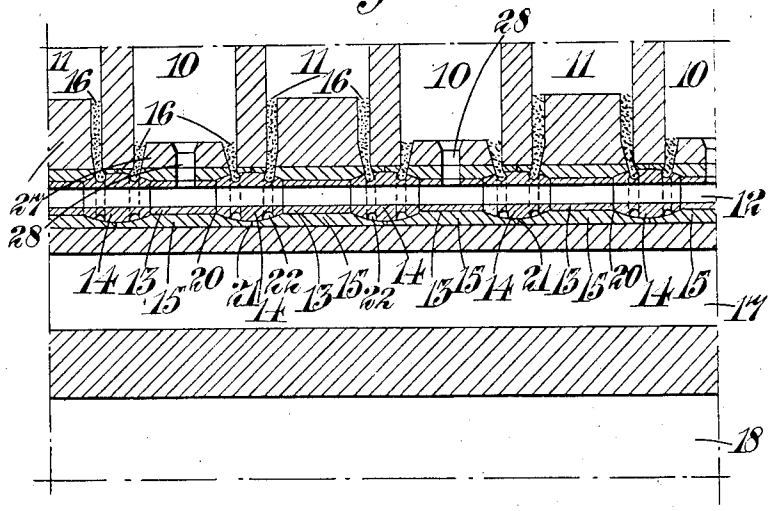
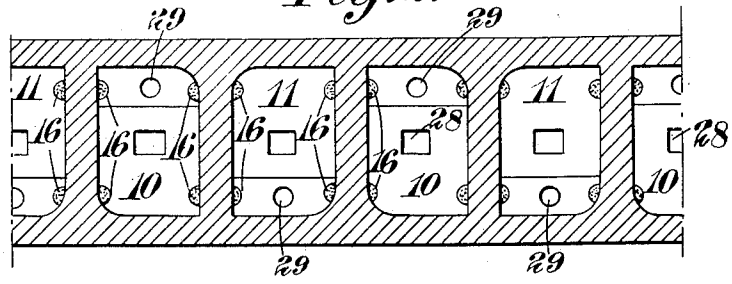


Fig. 2.



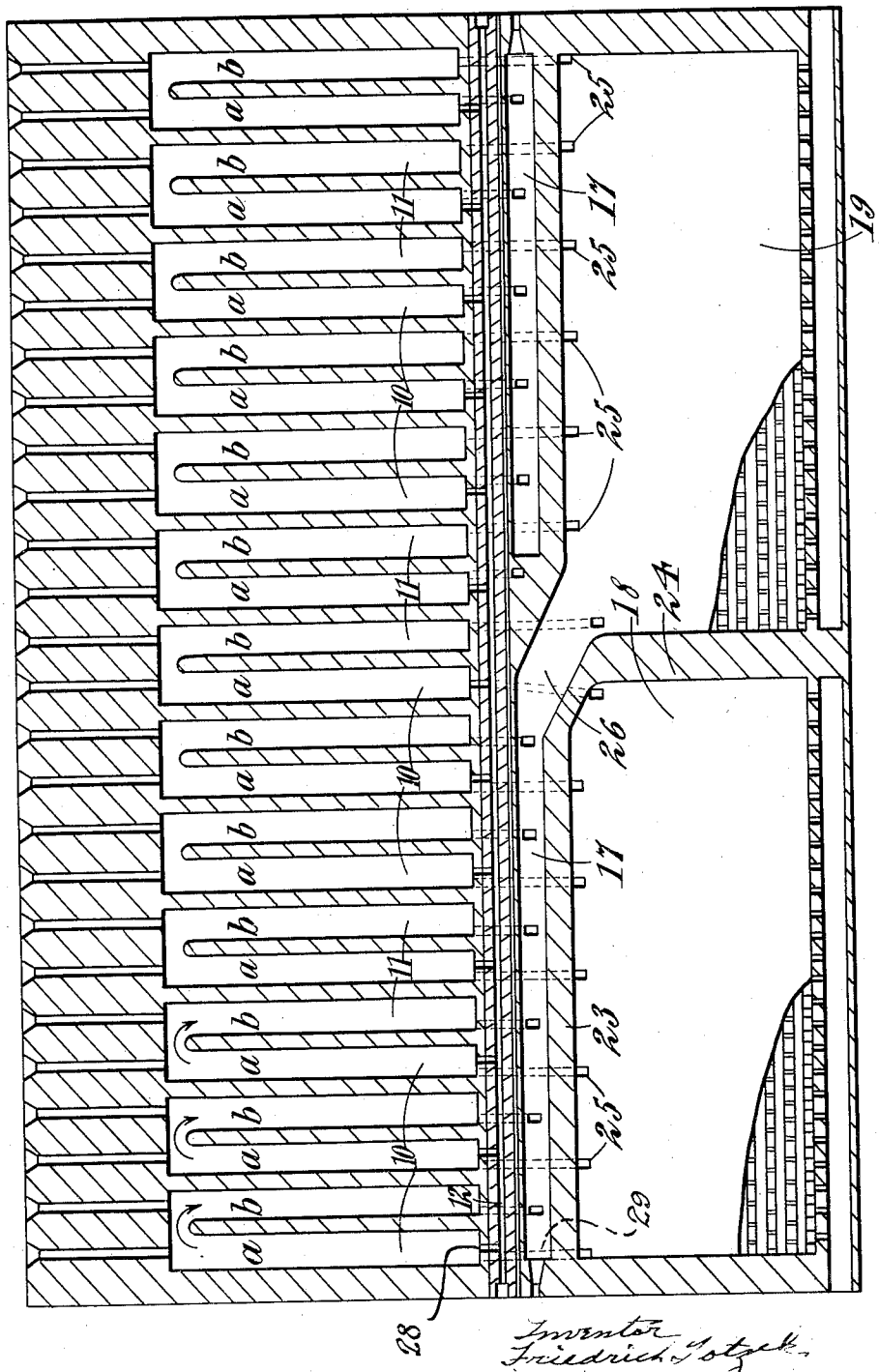
Inventor
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Fig. 3.



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1,882,553

UNITED STATES PATENT OFFICE

FRIEDRICH TOTZEK, OF ESSEN-STOPPENBERG, GERMANY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE KOPPERS COMPANY OF DELAWARE, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF DELAWARE

CHAMBER OVEN FOR THE PRODUCTION OF GAS AND COKE

Application filed January 16, 1931, Serial No. 509,063, and in Germany January 25, 1929.

This invention consists in improvements in or relating to chamber ovens for the production of gas and coke and is applied to that form of oven in which there is a horizontally-disposed strong gas distributing conduit in the sole of the oven. In a battery comprising a plurality of ovens there will, as will be readily understood, be a plurality of such strong gas conduits. An object of the invention is to provide a construction which will prevent passage of strong gas from these conduits into supply channels for waste gases lying nearby.

The present invention comprises the combination of a strong gas conduit comprising a plurality of pipe lengths and a surrounding sheath also comprising a plurality of pipe lengths, the arrangement being such that joints between the pipe lengths of the strong gas conduit are staggered relatively to those of the sheath in the direction of the length of the conduit. With this arrangement the joints of the gas conduit are surrounded by the surfaces of the pipe lengths of the sheath and the passage of the strong gas into the masonry and into adjacent channels is thereby considerably impeded.

This undesirable passage of gas from the conduit into adjacent channels is still further impeded by the provision of an annular packing situated between the joint of the gas conduit on the one hand, and an adjacent joint of the sheath on the other hand. There will be preferably a packing of this nature between each pair of adjacent joints in the gas conduit and sheath.

As will be understood from the following description, the construction is such as to enable these packings to be inserted through heating flues situated above the oven sole. Sand is preferably employed for the packing and this is found to be particularly advantageous as compared with a hitherto known construction in which the strong gas channel is imbedded in a rammed mass. This latter arrangement presents considerable disadvantages, amongst which may be mentioned the fact that the rammed mass in use hardens into a stone-like quality and does not accommodate the thermal expansion of the masonry which occurs during the operation of the oven. Cracks occur in use which give rise to gas leaks.

The present invention has the important advantage of retaining the proved oven construction embodying separate, handy, shaped blocks which can be built up in the cold state with expansion joints where necessary so that the separate portions of the structure can expand relatively to one another on heating.

The sealing of the strong gas conduits in accordance with the present invention is of particular advantage in the case of twin-flue ovens, that is to say, ovens in which reversal of the direction of draught is caused to occur intermittently from one heating flue unit to another or from one group of such flues to another group. In such an oven it is impossible to avoid positioning of channels supplying strong gas in the vicinity of channels which carry off waste gases. Hence, a construction in accordance with the present invention becomes particularly applicable.

One preferred form of the invention will now be described as an example with the aid of the accompanying drawings, in which—

Figure 1 is a section, in a plane extending lengthwise of an oven chamber, through a portion of a heating wall, and showing, in detail, those portions in the region of the oven sole;

Figure 2 is a plan of the parts shown in Figure 1, and

Figure 3 on a reduced scale is a central section, similar to that of Figure 1, showing all the essential features of a heating wall and the regenerators beneath it.

Like reference numerals indicate like parts in the several figures of the drawings.

Referring first of all to Figure 3, it will be seen that the invention is applied to a twin-flue oven in which a series of twin-flues 10 and 11 are formed in the heating wall. Regenerator portions 18 and 19 are situated below the oven sole 23 and hence each regenerator is divided, for draught reversal, into two halves 18 and 19 by a central transverse wall 24. The gaseous media pass directly from each regenerator portion 18 or 19 into

one half of the heating wall through conduits such as 25. The heating flues thus supplied directly are situated immediately above the regenerator portion in question. The flues in the other half of the heating wall are supplied from each regenerator portion through a sole channel 17 which lies immediately beneath the other half of the wall and starts from the top of the inner end of the regenerator portion and communicates with the sole channel by a conduit 26. These conduits from the regenerator portions 18 cross those from the regenerator portions 19 in the division wall 24. While the sole channels 17 running under one half of the oven are charged with gas or air at any particular moment under consideration, waste gases flow through the sole channels which run under the other half of the oven. In twin-flue ovens of this type, therefore, there is an additional circumstance to take into consideration, namely, that the strong gas channels 12, which are also arranged in the oven sole structure, are situated in the vicinity of the sole channels 17 through which the waste gases flow. If, therefore, there are leaks in the oven masonry, loss of strong gas may very readily occur owing to its passage into those channels 17 which at the time are carrying waste gases.

In Figure 3 the strong gas channel 12 shown therein is only indicated as a conduit in a formal manner. The details of the construction of this conduit, in accordance with the present invention, are illustrated in Figures 1 and 2 to which reference is now directed.

It will be seen from Figures 1 and 2 that below the twin-flues 10 and 11 in the heating wall there are provided strong gas channels 12 each of which is composed of a plurality of abutting pipe lengths 13 and 14. These pipe lengths are enclosed in sheaths 15 also composed of a plurality of abutting pipe lengths 15. It will be observed, however, that the joints 20 between the pipe lengths of the strong gas conduit 12, that is to say the places at which the pipe lengths 13 and 14 abut one another, are staggered relatively to the joints 21 of the sheath 15 considered lengthwise of the conduit.

Separating the adjacent joints 20 and 21 are annular sand packings filled into grooves 22 formed in the outer surfaces of the pipe lengths 14. In the bottom of each flue 10 and 11 is a block 27 in which are formed channels 16 communicating with the grooves 22. Thus, the grooves may be filled with sand introduced from the roof of the oven through the channels 16. Fine siliceous sand is used in known manner and it will be appreciated that in this way the passage of strong gas into the regenerators 18 or 19 or into the sole channels 17 is prevented.

In the blocks 27 there are formed conduits 28 which communicate with the strong gas conduit and also conduits 29 communicating with the sole channels 17 and ducts 25 for their respective regenerators.

The invention is particularly applicable to ovens of the type illustrated in the accompanying drawings, but it is to be understood that it is not limited to ovens of this type as it is applicable in any case in which strong gas channels are arranged in the vicinity of other channels or spaces into which leakage may otherwise occur. In particular, the invention is applicable to the construction described in my co-pending application Ser. No. 509,085, filed January 16, 1931.

I claim:

1. In a regenerative chamber oven, the combination of vertical heating flues therefor, a strong gas conduit lying below the flues and having communication with the flues, and comprising a plurality of pipe sections arranged in a series longitudinally of the conduit, and a sheath surrounding said pipe sections and comprising a plurality of pipe sections arranged with the joints of the pipe sections of the gas conduit staggered in relation to the joints of the sheath in the longitudinal direction of the conduit, annular channels around the conduit sections between the conduit sections and the sheath conduit, and filling conduits extending through the bottoms of the flues into said annular channels.

2. In a regenerative chamber oven, the combination of vertical heating flues therefor, a strong gas conduit lying below the flues and having communication with said flues and comprising a plurality of pipe sections arranged in a series longitudinally of the conduit, and a sheath surrounding said pipe sections and comprising a plurality of pipe sections arranged with the joints of the pipe sections of the gas conduit staggered in relation to the joints of the sheath in the longitudinal direction of the conduit, annular channels formed in sections of the gas conduit at positions to separate pairs of adjacent joints in the conduit and sheath respectively, considered longitudinally of the conduit, and filling channels formed in the bottoms of the flues and through the sheath to communicate with the said annular channels.

3. In a regenerative chamber oven, the combination of vertical heating flues therefor, a strong gas conduit lying below the flues and having communication with said flues and comprising a plurality of pipe sections arranged in a series longitudinally of the conduit, and a sheath surrounding said pipe sections and comprising a plurality of pipe sections arranged with the joints of the pipe sections of the gas conduit staggered in relation to the joints of the sheath in the longitudinal direction of the conduit, annular channels formed in sections of the gas con-

duit at positions to separate pairs of adjacent joints in the conduit and sheath respectively, considered longitudinally of the conduit, blocks in the bottom of each heating flue having passages in them by which communication is established between the flues and the strong gas conduit and the regenerators respectively, and filling channels formed in the blocks in the bottoms of the flues and through the sheath to communicate with the said annular channels.

4. In a regenerative chamber oven, the combination of vertical heating flues therefor, regenerators communicating with said flues and lying below the oven and heating flues, a horizontal strong gas conduit comprising a plurality of pipe sections arranged in a series longitudinally of the conduit lying below the heating flues and above the regenerators and communicating with the flues, a sheath surrounding said pipe sections and comprising a plurality of pipe sections arranged with the joints of the pipe sections of the gas conduit staggered in relation to the joints of the sheath in the longitudinal direction of the gas conduit, and channels around the conduit sections between the conduit sections and the sheath.

5. In a chamber oven, the combination of vertical heating flues therefor, waste gas offtake means communicating with said flues and lying below the oven and heating flues, a strong gas conduit comprising a plurality of pipe sections arranged in a series longitudinally of the conduit lying adjacent the waste gas offtake means and communicating with the flues, a sheath surrounding said pipe sections and comprising a plurality of pipe sections arranged with the joints of the pipe sections of the gas conduit staggered in relation to the joints of the sheath in a longitudinal direction of the gas conduit, and channels around the conduit sections between the conduit sections and the sheath at positions to separate pairs of adjacent joints in the conduit and sheath respectively, considered longitudinally of the gas conduit.

In testimony whereof I affix my signature.

FRIEDRICH TOTZEK.