A. ROBERTS.

COKE OVEN.

APPLICATION FILED SEPT. 15, 1916.

1,356,788.

Patented Oct. 26, 1920.

3 SHEETS—SHEET 1.

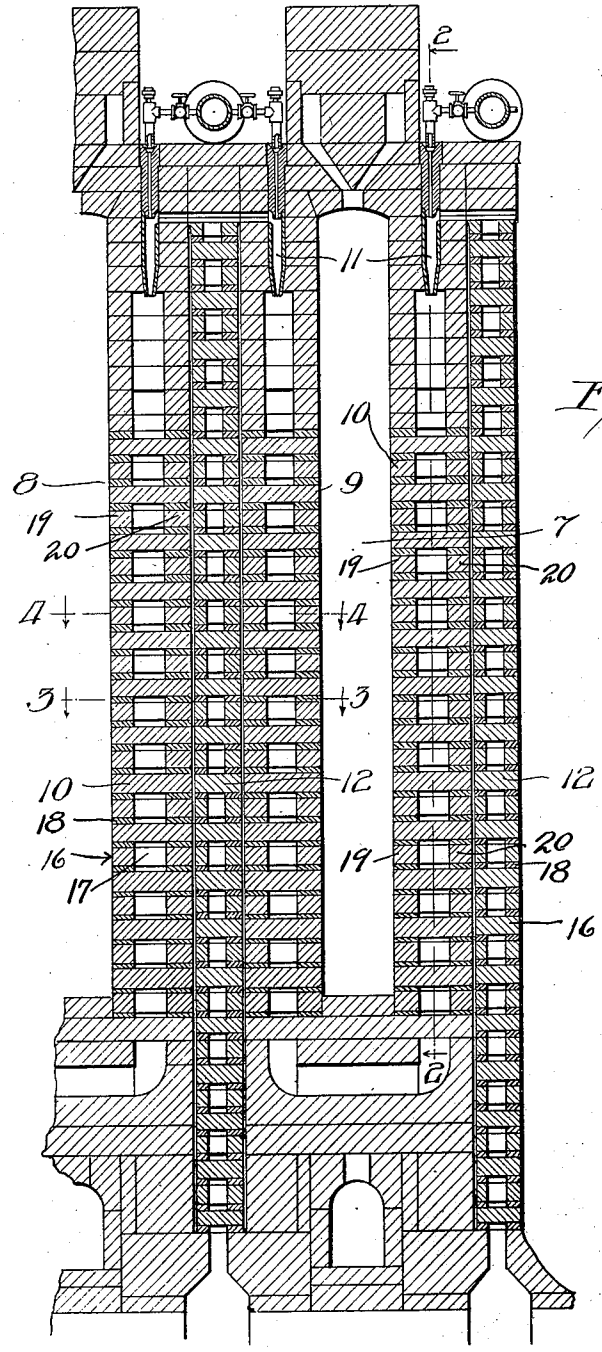


Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 2.

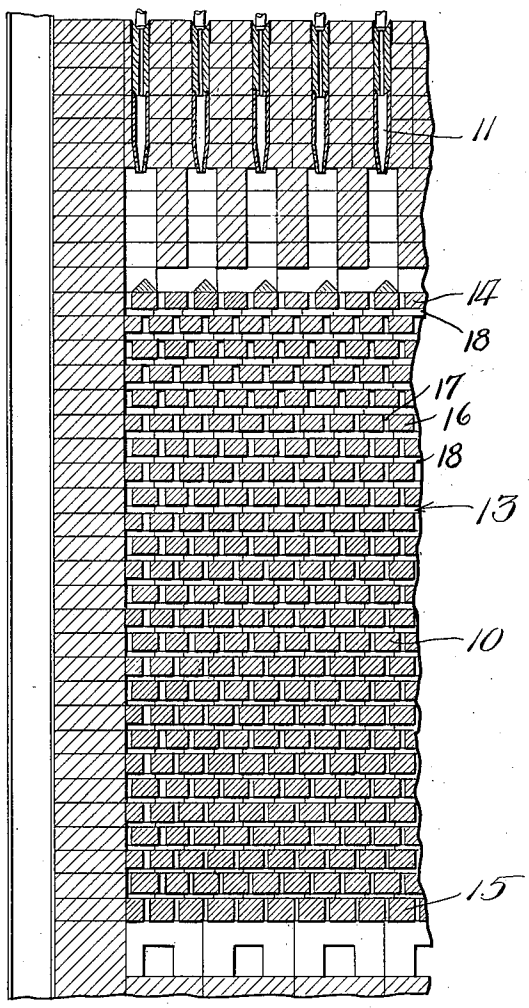


Fig. 5.

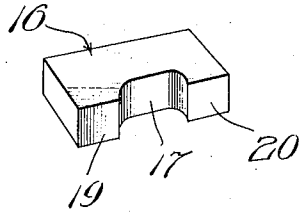
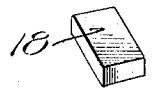


Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 3.

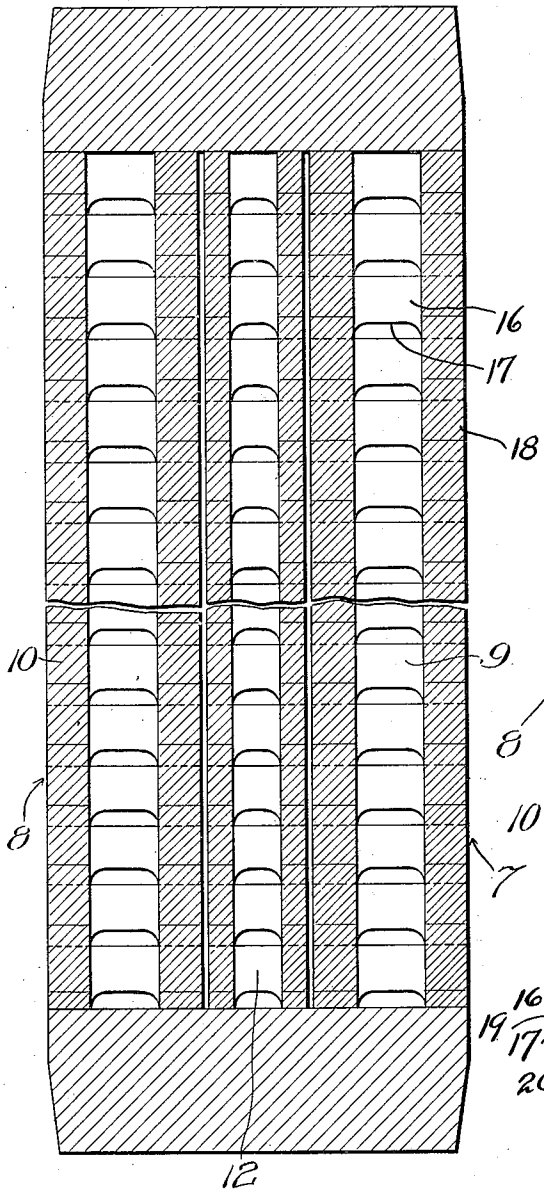
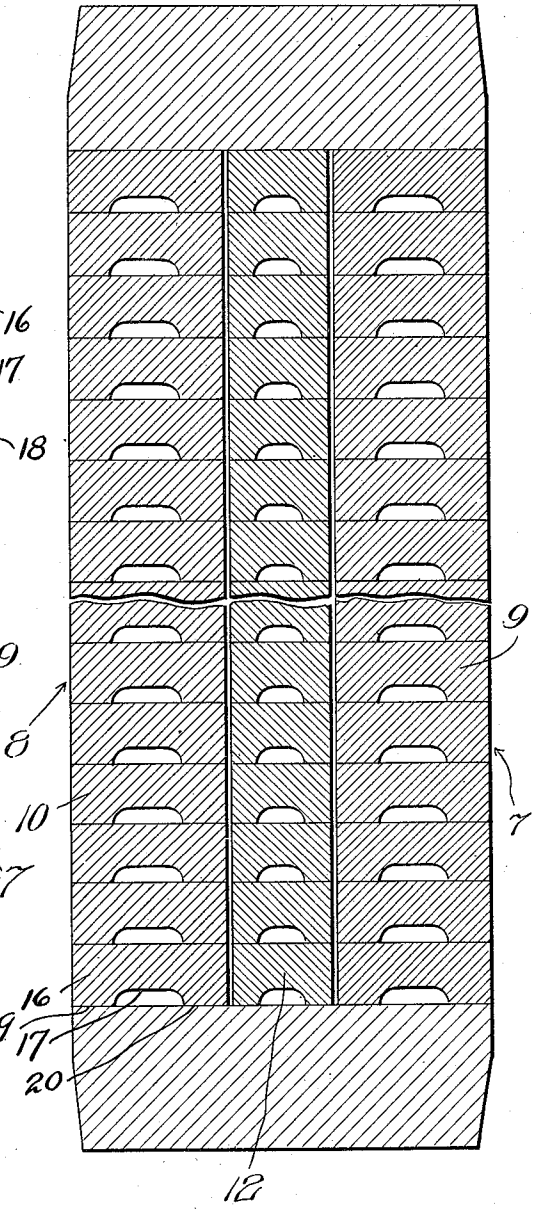


Fig. 4.



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UNITED STATES PATENT OFFICE.

ARTHUR ROBERTS, OF EVANSTON, ILLINOIS, ASSIGNOR TO AMERICAN COKE & CHEMICAL COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF MAINE.

COKE-OVEN.

1,356,788. Specification of Letters Patent. Patented Oct. 26, 1920.

Application filed September 15, 1916. Serial No. 120,350.

To all whom it may concern:

Be it known that I, ARTHUR ROBERTS, a citizen of the United States, residing at Evanston, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Coke-Ovens, of which the following is a specification.

The present invention has to do with improvements in coke oven construction and has particular reference to the construction of the walls whereby the heat is transferred from the heating gases to the carbonizing chamber, or vice versa.

In Letters Patent of the United States, No. 1,132,685, which was issued to me March 23, 1915, for improvements in coke ovens, I have shown a type of construction in which the walls are provided with a series or meshwork of interconnected gas passages. In the particular construction shown in the drawings of the said issued patent, this meshwork of passages is secured by building up the walls from blocks of peculiar formation. The blocks shown in the said issued patent are notched on their horizontal and vertical faces, so that when the blocks are set together, the notches on the horizontal and vertical faces will coöperate in such a way as to provide a complete meshwork of passages communicating not only vertically but also horizontally. When it is desired to bring the end portions of the different blocks into solid engagement with each other, and still secure the result of a meshwork of interconnected passages, each block should be notched on at least two adjacent faces in the manner shown in the drawings of said patent. This arrangement, however, presents the objection that, when each block is notched on a number of different faces, difficulty is sometimes experienced in molding and burning the blocks, so that the percentage of loss in manufacture is quite high.

One of the objects of the present invention is to provide a construction of wall in which there may be provided a meshwork of interconnected passages, while nevertheless making use of blocks which are notched on only a single face. This will make it possible to avoid the aforementioned objections which are encountered in the molding and burning of the blocks, while at the same time securing the desirable feature of a meshwork of interconnected passages.

Other objects and uses of the invention will appear from a detailed description of the same which consists in the features of construction and combinations of parts hereinafter described and claimed.

Referring to the drawings:

Figure 1 shows a vertical section through a complete coke oven, and portions of adjacent coke ovens embodying the features of the present invention;

Fig. 2 shows a fragmentary longitudinal section taken on the line 2—2 of Fig. 1, looking in the direction of the arrows.

Fig. 3 shows a fragmentary horizontal section taken on the line 3—3 of Fig. 1, looking in the direction of the arrows.

Fig. 4 shows a fragmentary horizontal section taken on the line 4—4 of Fig. 1, looking in the direction of the arrows;

Fig. 5 shows in perspective view one of the notched blocks used in building up the wall; and

Fig. 6 shows in perspective one of the spacer blocks which is used in separating the end portions of the notched blocks.

In Fig. 1, one of the carbonizing chambers is designated by the numeral 7, and the adjacent carbonizing chamber is designated by the numeral 8. Each carbonizing chamber has the heating walls 9 and 10. Along the upper portion of each heating wall there are located a plurality of burners 11 which receive gas and air in suitable quantities for combustion from whatever source may be decided upon. I have shown between the adjacent heating walls of consecutive ovens the recuperating walls 12. These recuperating walls are provided with vertically communicating passages and serve to transmit air upwardly from the foundation to the burners above. Each of the heating walls is provided on its interior, as shown in Fig. 2, with a meshwork of passages 13, which extend in zigzag fashion from the upper portion 14 of the wall to the lower portion 15 thereof. The burners 11 deliver their hot gases downwardly into the meshwork of passages in the heating wall, the gases traveling downwardly through said meshwork of passages in zigzag fashion.

The constructions generally described thus far are also shown in the aforementioned Letters Patent of the United States, No. 1,132,685. As previously mentioned,

the heating walls shown in the said issued patent are built up from a series of blocks which are notched on their horizontal and vertical faces, so that the meshwork of passages disclosed in the particular construction illustrated in the said issued patent is formed by the communication of these various passages with each other. In the present case, the heating wall is built up from a series of blocks 16, each of which is notched on only one face so as to provide the notch 17, the remaining faces being unnotched. When the blocks of this type are set together side by side in a course, the notches 17 will provide openings extending through the said course, whether the course extend horizontally or vertically. However, if two such courses be brought directly together with their blocks out of registry, it will be apparent that the openings of the one course will not communicate with the openings of the adjacent courses, unless the notches be of very large size, that is, more than 50% of the width of the blocks. It will be apparent, however, that by separating each course from the adjacent courses by the use of separating blocks between the end portions of the notched blocks, a meshwork of passages will be provided similar to the meshwork of passages disclosed in the aforesaid issued Letters Patent of the United States. Therefore, I have shown in the construction of the drawings herein an arrangement in which the end portions of the blocks of each course are separated from the end portions of the blocks of the adjacent courses by the use of spacer blocks 18. These spacer blocks are of approximately the same width as the uncut end portions 19 and 20 of the notched blocks, and the spacer blocks may be of any desired length.

When a wall is built up by the use of the notched blocks 16 in conjunction with spacer blocks 18, the said wall will present a series of interconnected horizontally and vertically extending passages, similar in appearance to the meshwork presented by the use of the blocks particularly illustrated in the said patent.

By regulating the sizes of the notches 17 and the thicknesses of the spacer blocks 18, the sizes of the passages may be graduated in different portions of the wall, so as to regulate or vary the degree of impingement in different portions of the wall. Or, on the contrary, all of the notches may be made of equal size, and all of the spacer blocks may be made of equal dimensions, so that the passages will remain of uniform size throughout the wall.

While I have shown in the drawings of this application an arrangement in which the courses of notched blocks 16 extend horizontally, still it will be manifest that the same principles are applicable in any other arrangement, the spacer blocks lying between the end portions of the courses of notched blocks.

While I have particularly described the use of the features of invention herein disclosed for the construction of heating walls, still it will be understood that the said features of invention may also be applied with equal desirability in many cases in the construction of other forms of wall for use in coke ovens, as, for example, in the construction of recuperating walls. Consequently, I have shown in the drawings of this case a construction in which recuperating walls are provided, and in which the said recuperating walls are built up from the use of blocks embodying the features of the present invention.

I claim:

1. A coke oven heating wall comprising a series of blocks laid in courses, each block having three of its faces which lie at right angles to the wall continuous faces, and its other face which lies at right angles to the wall notched, the blocks being laid in their respective courses with their notches extending across said courses, the end portions of the blocks being in vertical alinement with each other, and rows of spacer blocks located between said end portions of consecutive courses of blocks to thereby separate said courses a desired distance apart, and provide spaces between the central portions of the blocks in communication with the recesses of the blocks, substantially as described.

2. A heating wall comprising a series of course blocks and a series of spacer blocks, each course block extending through the wall from face to face thereof and having three of its faces which lie at right angles to the wall continuous, and having its fourth face which lies at right angles to the wall notched, the end portions of the course blocks lying in vertical alinement, and the spacer blocks being located between the end portions of the aforesaid continuous faces to thereby separate the central portions of the blocks and provide passages on the interior of the wall in communication with the aforesaid notches, substantially as described.

ARTHUR ROBERTS.

Witnesses:
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FRANCES M. FROST.