E. CURRAN.

FURNACE.

APPLICATION FILED JAN. 14, 1911.

1,015,616. Patented Jan. 23, 1912.

Fig. 1.

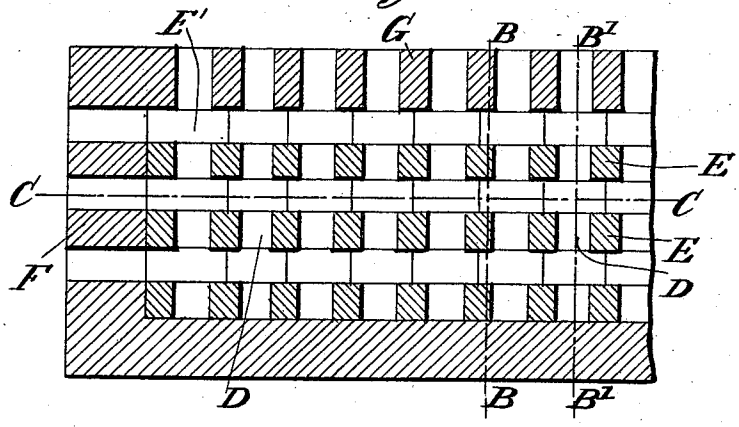


Fig. 3.

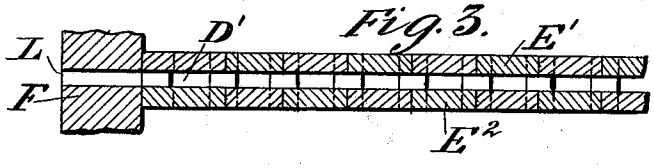


Fig. 2.

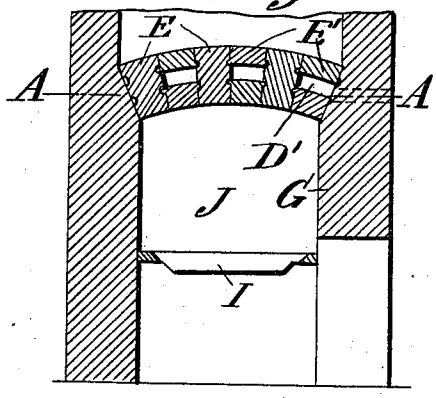
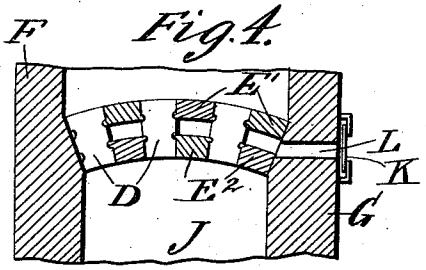


Fig. 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

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FURNACE.

1,015,616. Specification of Letters Patent. Patented Jan. 23, 1912.

Application filed January 14, 1911. Serial No. 602,724.

To all whom it may concern:

Be it known that I, EDWARD CURRAN, a subject of the King of Great Britain, residing at 19 Sandon street, Cardiff, in the county of Glamorgan, Wales, England, furnace-builder, have invented certain new and useful Improvements in Furnaces, of which the following is a specification.

The object of this invention is to insure the complete combustion as far as possible of the smoke and gases given off from the primary combustion or fire spaces of furnaces, ovens and the like, and the invention may be stated broadly to consist in providing a recuperator of an improved character in the shape of an arch of firebrick or the like fixed in a suitable place and through which the products of combustion of the primary combustion space pass, the essential feature of the recuperator according to this invention being that it is so built as to provide continuous transverse and longitudinal passages through the brickwork, which are supplied with air whereby the imperfectly consumed gases and other combustion products from the primary combustion space are completely burned, the temperature of the recuperator necessary for efficient and complete combustion being maintained by the heat of the gases passing through it from the fire grate, and their combustion in the passages of the arch.

The arch of firebrick or other suitable refractory material is interposed at a suitable point in the path of the hot gases from the primary combustion space or furnace to the point of utilization; for example, it may be built a suitable distance, say about two feet, above the fire bars of the furnace or the like, and may be arranged to cover the whole or only part of the area of the fire grate. This arch is so constructed that between the bricks of which it is composed and which may be imperforate there are vertical openings suitably distributed over the arch and extending therethrough, through which the furnace gases may pass, and continuous longitudinal and transverse passages throughout the whole length and the whole width respectively of the brickwork of the arch. Each of the longitudinal and transverse passages is in communication with a space or header or flue which has an opening or openings to the atmosphere, such opening or openings being controlled by one or more suitable dampers.

In the accompanying drawings Figure 1 is a sectional plan of such a recuperator arch, the section being taken on line A—A of Fig. 2; Figs. 2 and 4 are transverse sections of the arch on lines B—B, B′—B′, respectively, of Fig. 1; and Fig. 3 is a longitudinal vertical section of the arch on line C—C of Fig. 1.

The arch is composed of a number of rows of firebricks placed longitudinally of the furnace and keyed one into the other. Alternate rows comprise bricks E disposed so as to leave vertical spaces D between each pair of bricks E. The remaining rows comprise a pair of superposed bricks E′, E², keyed into the bricks E of the adjacent rows and disposed to leave a space D′ between them. The spaces D′ form a series of continuous longitudinal passages and in combination with the spaces D, form a series of continuous transverse passages. These passages may be arranged to be in communication with the atmosphere through openings L, for example, in the respective furnace walls F and G, as shown in Figs. 3 and 4. The openings L in the wall F may be located, for example, at one or both ends or at intermediate points giving access from the atmosphere either to the longitudinal passages or the transverse passages, or to both. The hot gases from the combustion space J over the floor or fire grate I of the furnace pass up through the vertical spaces D in the arch. The atmospheric air introduced through the openings L in the walls of the furnace passes along the longitudinal and transverse passages or ducts, and, even if not already preheated, being heated by the hot brickwork of the arch, combines at a high temperature with the unconsumed and partially consumed products of the combustion space or furnace, which are thereby completely burned, the products of combustion passing onward to the point at which the hot gases are utilized. One or more of the openings L may be controlled by dampers as shown at K, Fig. 4.

Having fully described my invention, I claim:

1. In a furnace, a recuperator brickwork arch interposed in the path of the furnace gases, and consisting of rows of bricks keyed one into the other and disposed longitudinally of the furnace, the bricks in the rows being spaced apart to form both upwardly directed passages in the arch for the com-

bustion gases to pass through and also passages extending longitudinally and transversely through the arch and communicating both with the said combustion gas passages and the atmosphere.

2. In a furnace, a recuperator brickwork arch interposed in the path of the furnace gases and consisting of two alternating rows of bricks which may be imperforate and are placed longitudinally of the furnace, one row comprising bricks which are disposed with respect to each other so as to leave between each pair of opposing ends thereof a vertical space, the said spaces serving as passages for combustion gases to pass through the arch, and the other row comprising an upper and a lower layer of bricks disposed to leave a longitudinal passage intermediate of the layers communicating with the combustion gas passages, the furnace wall having openings communicating with the atmosphere and with the said longitudinal passages.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD CURRAN.

Witnesses:
JOSEPH MILLARD,
WALTER J. SKERTEN.