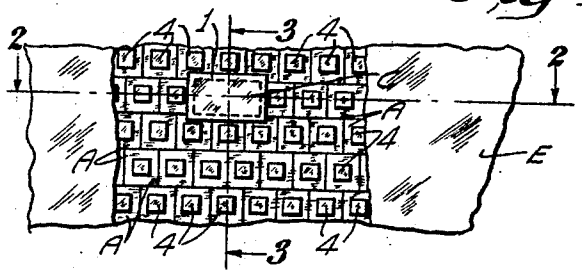
Feb. 16, 1926. 1,573,188

G. M. PARKER

BOILER WALL

Filed June 30, 1924

Fig. 1.



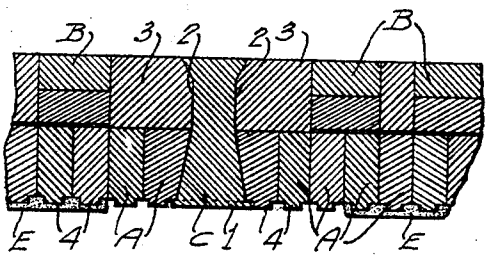


Fig. 2.

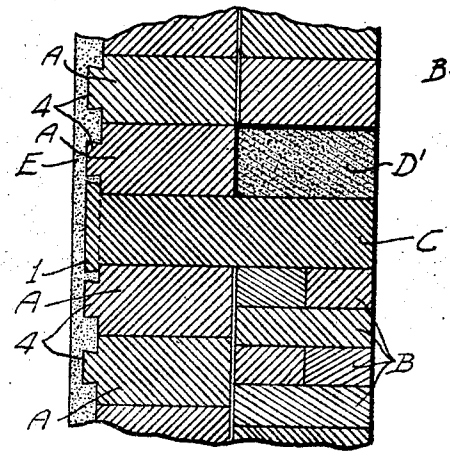


Fig. 3.

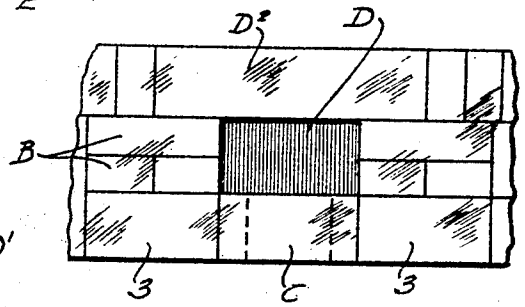


Fig. 4.

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UNITED STATES PATENT OFFICE.

GEORGE M. PARKER, OF ST. LOUIS, MISSOURI.

BOILER WALL.

Application filed June 30, 1924. Serial No. 723,214.

To all whom it may concern:

Be it known that I, GEORGE M. PARKER, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Boiler Walls, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to brick walls of the kind that are used in boilers, such, for example, as bridge walls and the side walls of boiler settings. Prior to my invention it was the usual custom to construct a wall of the kind referred to from brick combined in such a way as to form a solid wall of about eighteen inches in thickness, whose front and rear portions are integrally connected together. Due to the fact that the inner portion of a wall of the kind mentioned is subjected to exceedingly high temperatures, it is necessary to frequently replace the bricks that constitute said inner portion, and as the front portion and rear portion of the wall are integrally connected together, it is necessary to reconstruct the entire wall when the bricks in the front portion of the wall have to be renewed.

The main object of my invention is to provide a furnace wall in which the bricks or tile constituting the front portion of the wall can be renewed or replaced when they burn out without the necessity of tearing down and rebuilding the entire wall.

Another object is to provide a brick or tile furnace wall whose front side is protected by a refractory face or coating that is securely interlocked with the brick of the wall.

And still another object is to provide a novel method of constructing furnace walls. Other objects and desirable features of my invention will be hereinafter pointed out.

To this end I have devised a furnace wall that is composed of a front portion constructed as an independent unit, a back portion constructed as an independent unit, and a means for securely tying said front portion to said back portion constructed in such a way that the front portion can be repaired or rebuilt without tearing down and rebuilding the back portion of the wall.

Figure 1 of the drawings is a front elevational view of a portion of a furnace wall constructed in accordance with my invention and adapted to be used either as a bridge wall or as one wall of a boiler setting.

Figure 2 is a horizontal sectional view of said wall.

Figure 3 is a vertical sectional view of said wall; and

Figure 4 is a rear elevational view of said wall, showing one of the openings in the back portion of the wall that are used in the operation of inserting and removing the key tile.

Referring to the drawings which illustrate the preferred form of my invention, A designates a plurality of fire brick or tile that constitute the front portion of my improved wall, and B designates a plurality of brick or tile that constitute the back portion of said wall. The brick A are arranged in horizontal courses with the bricks in each course extending parallel to each other transversely of the wall, as shown in Figure 2, and the joints of the respective courses staggered or arranged in break-joint relation, as shown in Figure 1. The bricks B that constitute the back portion of the wall can be arranged in any preferred manner, usually, however, with some of the brick B disposed at right angles to the other bricks so as to act as headers. The front portion of the wall, formed by the brick A, is tied to the back portion of the wall formed by the brick B by key tile C, each of which is provided at its front end with a flange 1 that laps over the front face of the front portion of the wall, and a wedge-shaped part adjacent said flange that acts as a key to prevent the front portion of the wall from moving forwardly away from the back portion. Said key tile are provided adjacent their rear ends with flared portions or with recesses or grooves, designated by the reference character 2 in Figure 2, that are adapted to receive locking elements 3 that form part of the back portion of the wall. The particular shape of the key tile C is immaterial, so far as my broad idea is concerned, but I prefer to use key tile that corresponds in length to the thickness of the wall, correspond in width to the width of two of the bricks A and correspond in depth or thickness to the thickness of the brick A. Thus, if brick A nine inches long, four and one-half inches wide and four and one half inches in thickness are used, the key tile C will have a

length of approximately eighteen inches, a width of approximately nine inches and a depth of approximately four and one-half inches. In constructing the wall I arrange the key tile C in position during the operation of laying up the brick A that constitute the front portion of the wall, said key tile being located at different points in the wall and sufficient key tile being used to insure the front portion of the wall being securely tied to the back portion of the wall. In laying up the brick B that constitute the back portion of the wall the locking elements 3 that co-operate with the key tile C are arranged in the back portion of the wall in such a way that they will be interlocked with the rear end portions of the key tile C, as shown in Figure 2. The particular shape or form of the flared portion or the recesses or grooves 2 in the rear end portion of the key tile is immaterial, but I prefer to use locking elements 3 that have inclined or wedge-shaped ends and provide the key tile C with tapered recesses or inclined surfaces in the side faces of their rear end portions so that when the locking elements 3 are interlocked with the key tile C said key tile will be effectively held against movement forwardly away from the back portion of the wall. Due to the fact that the key tile C are provided adjacent their front ends with wedge-shaped portions keyed between the brick in the front portion of the wall, and laterally-projecting flanges 1 that lap over the front ends of the brick A which surround said key tile, the front and back portions of the wall will be securely tied together after the locking elements 3 in the back portion of the wall have been arranged in interlocking engagement with the rear end portions of the key tile.

In order to overcome the necessity of disturbing the brick B in the back portion of the wall during the operation of renewing or replacing the brick A that constitute the front portion of the wall, I leave openings D in the back portion of the wall, as shown in Figure 4, at points directly above the key tile C so as to permit the key tile to be moved upwardly out of interlocking engagement with the locking elements 3 in the back portion of the wall. Each of the openings D corresponds in width and depth to the width and depth of the key tile C with which it co-operates, and as each of said openings D is arranged directly above portions of two of the locking elements 3 in the back portion of the wall, the key tile C can be easily disengaged from the back portion of the wall by moving said key tile upwardly into the openings D and then drawing said key tile forwardly out of said openings D, it being of course understood that in the operation of tearing down the front portion of the wall the horizontal courses of brick A that constitute said front portion are removed, one at a time, beginning at the top of the wall and working downwardly.

From the foregoing it will be seen that my invention greatly facilitates the repair or renewal of furnace walls, because it overcomes the necessity of tearing down the entire wall and completely reconstructing same each time the brick in the front face of the wall burn out or become so defective that they have to be renewed. In practice the openings D that are left in the back portion of the wall are filled with fire clay or any other suitable filling material D′ that can be removed easily when it becomes necessary to disengage the key tile C from the back portion of the wall.

Another feature of my invention which I believe to be novel is constructing a brick furnace wall in such a way that a refractory coating or facing formed of plastic material can be applied easily to the front side of the wall, and which, after it has hardened or set, will be securely locked to the wall. To this end I provide the front ends of the brick A with anchoring devices 4, consisting of undercut recesses or projections, so that when a plastic substance is applied to the front face of the wall to form a refractory coating or face E for same, as shown in Figure 3, the anchoring devices 4 on the brick A will be interlocked with said substance, and thus maintain the refractory facing E of the wall in operative position, even though cracks develop in said facing. The particular shape and arrangement of the projections 4 on the brick A is immaterial, but in most instances said projections will be undercut slightly or made of substantially dove-tail form so as to cause the plastic substance used to form the refractory facing of the wall to be securely interlocked with the brick in the front portion of the wall. While I prefer to provide the wall with a refractory facing or coating formed from a plastic substance that can be spread over the front ends of the brick A after the wall has been erected, it is immaterial, so far as my broad idea is concerned, whether or not the wall is provided with a refractory facing. A refractory facing, however, materially prolongs the life of the wall, and as said facing is formed from a substance that can be applied in a plastic condition, it is a simple matter to repair any cracks or joints that develop in the facing of the wall. Owing to the fact that the openings D left in the back portion of the wall to facilitate the insertion and removal of the key tile, are of approximately the same width as the length of the brick B used in the construction of the back portion of the wall, it is necessary to arrange a relatively long brick or "stretcher" D^2 over

each of said openings, as shown in Figure 4, so as to span said opening, and thus provide an adequate support for the bricks above the opening. While I have stated that the front and rear portions of the wall are formed from brick A and B, I wish it to be understood that it is immaterial whether the elements used to form said portions consist of brick or tile, the term "brick" as herein used meaning either brick or tile of the kind used in the construction of furnace walls and bridge walls.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A furnace wall, comprising a back portion constructed as a unit, a front portion constructed as an independent unit, key tile arranged at separated points in the front portion of the wall and provided at their front ends with integral portions which tend to prevent said front portion from moving forwardly away from said back portion, said key tile corresponding in length to the combined thickness of said front and rear portions, elements in the back portion of the wall with which the rear end portions of said key tile are interlocked, and openings in the back portion of the wall arranged adjacent said locking elements and disposed so as to permit said key tile to be disengaged from said locking elements without disturbing said locking elements during the operation of reconstructing the front portion of the wall.

2. A furnace wall, comprising a back portion constructed as a unit, a front portion constructed as an independent unit and composed of brick provided at their front ends with undercut devices, a refractory facing for said wall interlocked with said undercut devices and formed from a substance that is applied to the wall in a plastic state, key tile arranged at separated points in the front portion of the wall and provided at their front ends with means which tend to prevent said front portion from moving forwardly away from said back portion, said key tile corresponding in length to the combined thickness of said front and rear portions, and elements in the back portion of the wall with which the rear end portions of said key tile are interlocked.

GEORGE M. PARKER.