O. WUNDRACK.

FLAT ARCH FOR FURNACES.

APPLICATION FILED DEC. 14, 1916.

1,339,615.

Patented May 11, 1920.

2 SHEETS—SHEET 1.

Fig. 1

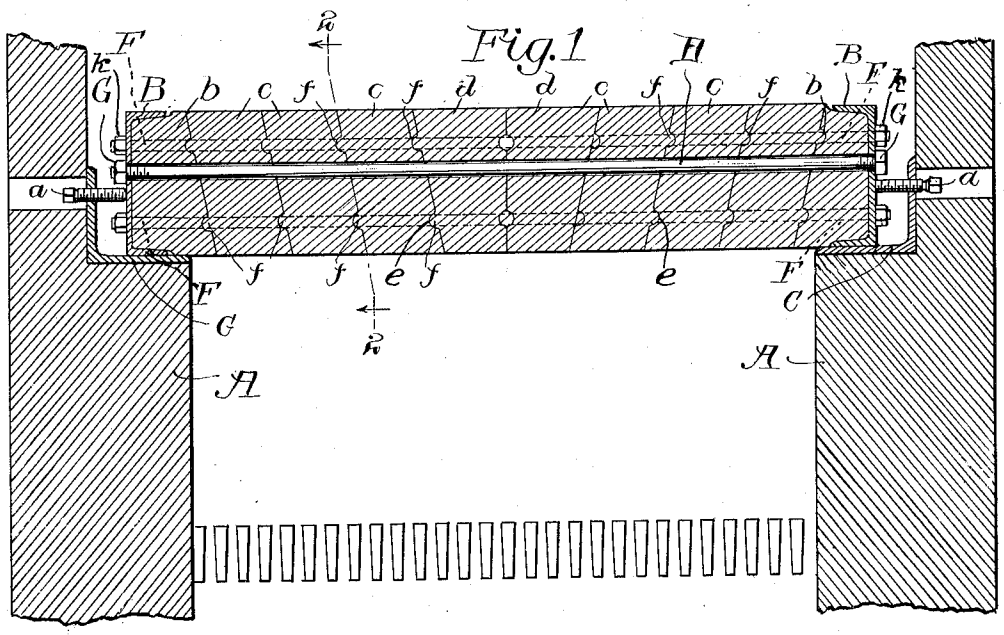


Fig. 2

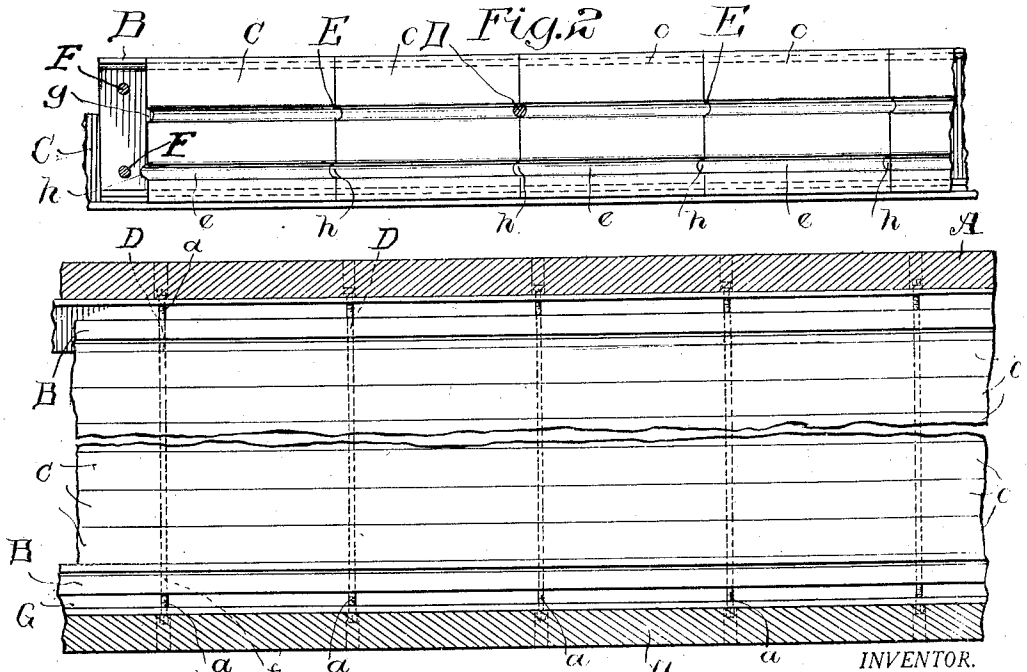


Fig. 3

WITNESSES:

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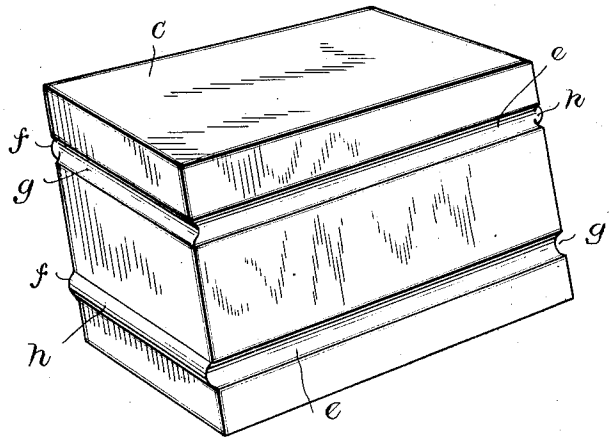


Fig. 4

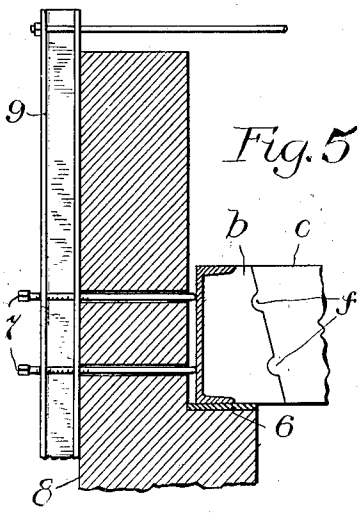


Fig. 5

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OTTO WUNDRACK, OF MAYWOOD, ILLINOIS.

FLAT ARCH FOR FURNACES.

1,339,615. Specification of Letters Patent. Patented May 11, 1920.

Application filed December 14, 1916. Serial No. 136,910.

To all whom it may concern:

Be it known that I, OTTO WUNDRACK, a citizen of the United States, residing at Maywood, in the county of Cook and State of Illinois, have invented new and useful Improvements in Flat Arches for Furnaces, of which the following is a full, clear, and exact description.

My invention relates to non-collapsible arches for furnaces, and particularly for the furnaces used in bakers' ovens.

The object of my invention is to provide a simple construction of the tile or brick for a flat arch that will render it non-collapsible and movable abutments for said arch that will accommodate the expansion and contraction thereof due to the different temperatures to which the same are subjected without in the least affecting the stability of the arch. This I accomplish by the means hereinafter fully described, and as particularly pointed out in the claims.

In the drawings:

Figure 1 is a transverse section of the furnace of a baker's oven showing my improvements applied thereto.

Fig. 2 is a section through a portion of said arch taken in the direction of length of the same.

Fig. 3 is a plan view of my improved arch.

Fig. 4 is a perspective view of one of the arch tiles thereof.

Fig. 5 is a transverse section of a fragment of a modified construction of the abutment thereof.

Referring to the drawings, A represents the side-walls of a furnace, the upper ends of which are recessed or rabbeted to support the channel-iron abutments B, B, and the angle-iron seat C therefor upon the horizontal flange of which said channel iron rests. The channel abutments extend from end to end of the chamber that is roofed over by my improved arch, and so likewise does angle-iron seat C, and said channel abutments are adapted to be adjusted laterally by a series of set-screws *a*, *a*, that are tapped through the vertical legs or flanges of the angle-iron seats, preferably, at equal distances apart.

The flat arch springing from abutments B comprises a series of tiles, the end tiles or springers *b*, *b*, of which have the upper and lower edges of their outer sides rabbeted to enable them to enter between the upper and lower flanges of the abutments and bear against the web thereof. The inner sides of these springers *b*, *b*, are inclined from the top toward the center of the furnace, and the longitudinal side edges of the arch-tiles *c*, *c*, interposed between said springers and the center or key-tiles *d*, *d*, are correspondingly inclined in the well known manner. The longitudinal sides of key-tiles *d*, *d*, that engage at the center of the span of the arch are vertical and their opposite or outer sides incline in planes parallel to the incline of the sides of the arch-tiles.

The sides of the springers and arch-tiles facing the center of the arch are each provided near their upper and lower sides with corresponding longitudinal grooves *e*, *e*, and the sides of the arch-tiles and key-tiles facing abutments B are provided with longitudinal ribs or tongues *f*, *f*, that correspond in shape to and enter the grooves *e* in the opposing surfaces of the adjacent tiles. These tiles are, preferably, more than twice as long as they are wide, and their front and rear vertical sides are provided with transverse grooves *g* and transverse tongues *h*, respectively; tongues *h* of the tiles engaging the grooves in the engaging surfaces of the next tiles, and so on. The longitudinal and transverse grooves and tongues securely hold the arch-tiles together and prevent the arch from collapsing, and yet permit of a certain amount of uneven expansion and contraction thereof without affecting its stability or the connection between tile and tile.

The channel-beam abutments are connected and held in this connected relation by a series of transverse tie-rods D that extend through openings E in the arch. The threaded ends of these tie-rods extend through the vertical webs of said channel-beam abutments and are provided with nuts G by means of which the said abutments and arch-tiles are held in close contact.

At the ends of the furnace, I prefer to connect said abutments by two tie-rods F that are arranged one above the other in the same transverse plane and have nuts *k* screwed onto the same to tighten the arch structure between the end portions of the abutments.

Although my improved arch is non-collapsible, when subjected to heat it will expand, and when allowed to cool off it will

contract. The construction of the arch-tiles is such that when heated they will accommodate a limited amount of expansion by an upper thrust; as this expansion takes place, however, the attendant manipulates set-screws, *a*, *a*, to accommodate the side thrust of the arch, which can be readily observed, and yet maintain the relative position of the arch-tiles to one another.

In Fig. 5 of the drawings, I show a modified construction of the abutments of my improved arch in which a flat plate 6 is substituted for angle-iron seat C. The set-screws 7, 7, in this modification extend out through the side-walls 8, 8, of the furnace, and the outer screw-threaded ends of these set-screws extend through the flanges of a vertically disposed channel or other metal beam 9 secured against the outer surface of said side-walls in any suitable manner.

What I claim as new is:—

1. An arch for furnaces comprising several courses each consisting of springer-tiles, arch-tiles and key-tiles, the contacting longitudinal sides of which are, excepting the meeting longitudinal surfaces of the key-tiles, inclined downward toward the transverse center of the furnace, each tile of each course having longitudinal tongues projecting from one inclined side thereof and longitudinal grooves in the opposite inclined side thereof, the longitudinal tongues of each tile entering the longitudinal grooves in the contacting inclined side of the next tile, and each tile of each course being provided with transverse tongues in one end and transverse grooves in the opposite end, the transverse tongues of the tiles of each course entering the transverse grooves in the contacting ends of the tiles of the next course, metal abutments for said springer-tiles, and means for regulating the lateral position thereof.

2. A flat arch for furnaces comprising several courses each consisting of transversely arranged springer-tiles, arch-tiles and key-tiles, the longitudinal contacting sides of each of which, excepting the contacting longitudinal side surfaces of the key-tiles, are inclined downward toward the transverse center of the furnace, one of the inclined contacting sides of each of said tiles having longitudinal tongues projecting therefrom and the opposite contacting inclined side of each tile having longitudinal grooves therein, the longitudinal tongues of one tile entering the longitudinal grooves in the contacting side of the next tile, and each tile having transverse grooves in one end and transverse tongues in the opposite end and the transverse tongues of the tiles of one course entering the transverse grooves of the tiles of the next contacting course, longitudinally disposed angle-iron beams supported by the side walls of said furnace, and extending the entire length of the fire chamber thereof, channel-iron beam abutments resting on said beams and corresponding in length thereto, and set-screws tapped through said angle-irons and impinging transversely against said abutments.

3. In a furnace, the combination with a flat arch comprising a plurality of transverse courses of tile consisting of springer-tiles, arch-tiles and key-tiles, of longitudinal channel-irons against and between the flanges of which the springer-tiles of said courses are seated, longitudinal angle-irons supported by the side-walls of the furnace upon the horizontal flanges of which said channel-irons rest, and set-screws tapped through said angle irons and impinging against channel-irons.

In witness whereof I have hereunto set my hand this 23rd day of November, 1916.

OTTO WUNDRACK.

Witnesses:
FRANK D. THOMASON,
FLORENCE MITCHELL.