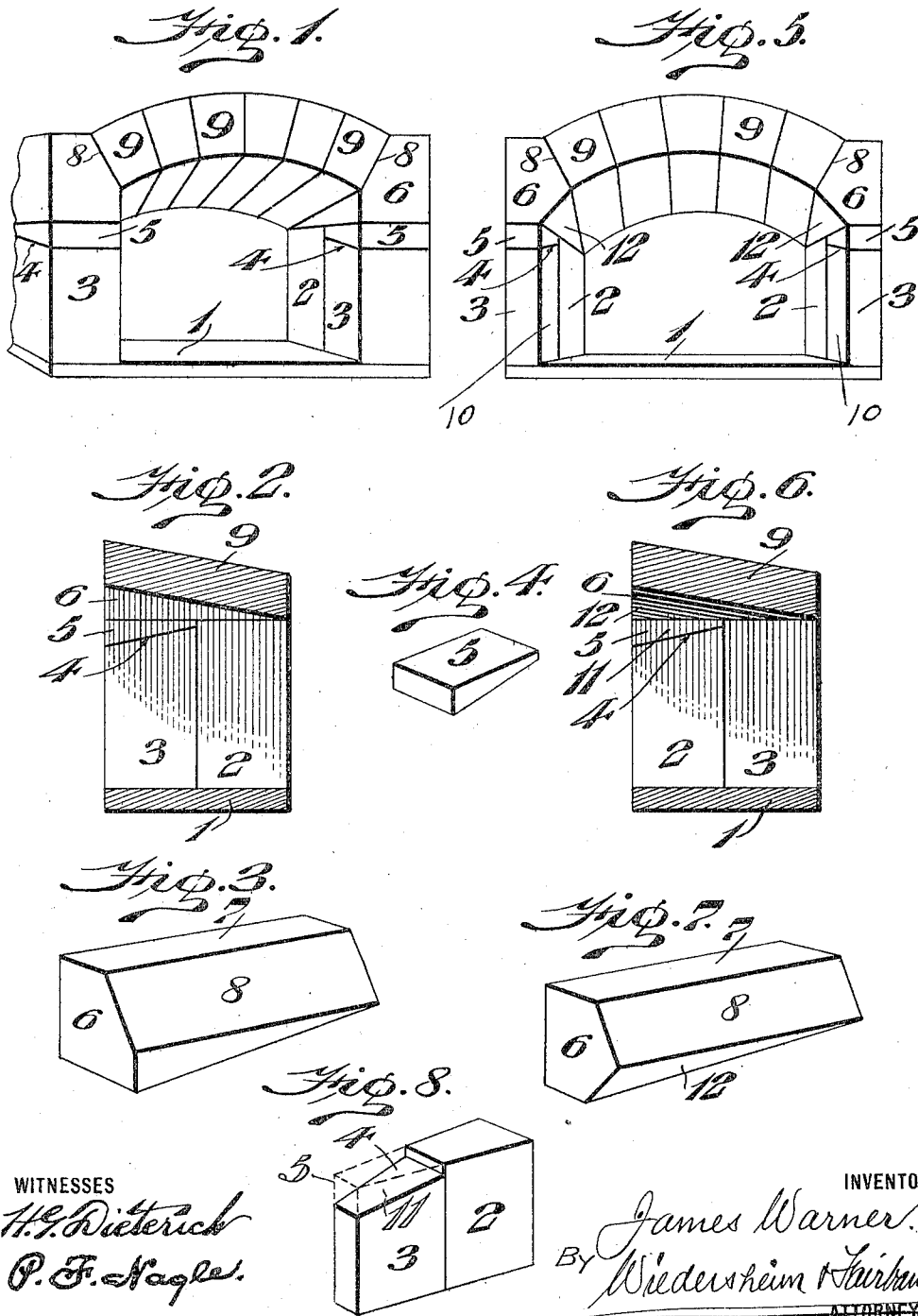


J. WARNER.
 ARCH CONSTRUCTION.
 APPLICATION FILED MAY 24, 1912.

1,038,996.

Patented Sept. 17, 1912.



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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JAMES WARNER, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Arch Construction, of which the following is a specification.

My invention consists of an improved fire-door arch for furnaces which admits of repairs being made without disturbing the general structure of the arch.

It further consists of an improved construction of the skew-back blocks in a rearwardly flaring arch.

It further consists of other novel features of construction all as will be hereinafter fully set forth.

The annexed drawings and the following description set forth in detail one mechanical form embodying the invention, such detail construction being but one of the various mechanical forms in which the principle of the invention may be used.

Figure 1 represents a perspective view from the rear or inner side of a fire-door arch embodying my invention, illustrating the same as applied to a straight fire-door opening. Fig. 2 represents a longitudinal section of the same. Fig. 3 represents a perspective view of a skew-back block for such construction. Fig. 4 represents a perspective view of one of the wedge-blocks employed in the piers of the arch. Fig. 5 represents a rear elevation of a flaring arch embodying my invention. Fig. 6 represents a longitudinal section of the same. Fig. 7 represents a perspective view of one of the skew-back blocks employed in this construction. Fig. 8 represents a perspective view of the pier-blocks of this form of construction.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings, the reference numeral 1 indicates the dead-plate of the fire-door opening of a furnace, and upon which the arch is built. The piers are formed from two or more pier-blocks, 2 and 3, and the inner blocks, 3, are shorter than the outer blocks and have their upper ends, 4, rearwardly and downwardly inclined. Wedge-shaped blocks, 5, rest upon such inclined ends to make the upper faces of the piers level. Skew-back blocks, 6, rest with their level under sides upon the piers. The upper sides, 7, of said blocks are forwardly

inclined, and the inner sides of the blocks are beveled parallel with the inclined upper sides to form forwardly inclined and inwardly beveled seats, 8, for the outer courses of the voussoir-blocks, 9, which abut against such seats.

In the form of arch illustrated in Figs. 5, 6, 7 and 8, the inner faces, 10, of the pier-blocks are divergently oblique to make an inwardly flaring fire-door opening. The inner edges, 11, of the wedge-blocks 5 are correspondingly oblique. The lower portions of the inner sides of the skew-back blocks, below the beveled seats are outwardly beveled to form triangular flaring faces, 12, the lower edges of which follow and register with the upper diverging edges of the pier-blocks and wedges.

Heretofore, the pier-blocks of fire-door openings in furnaces have usually been formed by one block or slab of fireproof material. The inner portions of these blocks, being more directly exposed to the action of the fire in the furnace, naturally burn out and deteriorate quicker than the outer portions, but, when such portions of the blocks have burned out, it has been necessary to remove the entire block, necessitating propping up of the top arch while the pier-block was removed and replaced, besides considerable labor being involved and risk incurred in such demolition and repair. In the present construction, when one or both inner pier-blocks are burned out, the wedge-block is knocked out, when the inner block is easily removed, while the skew-back block and the arch remain supported upon the outer block. A new inner block is thereupon placed and a new wedge-block inserted and secured by suitable mortar or cement, all without the necessity of providing false-work or other support for the arch. As the outer pier-blocks are not exposed to as high a temperature as the inner blocks, one outer block may outlast several inner blocks, so that considerable economy is attained in this construction besides that gained in quickness and simplicity of repair. By employing the form of skew-back block disclosed for inwardly flaring fire-door openings, the necessity for building up the corners between the skew-backs and the piers by pieces of fire-brick and mortar is avoided, the lower, triangular bevels of the skew-backs providing the flare at such corners.

It is obvious that structural changes may

be made in the structures herein disclosed while retaining the principles of invention set forth in the following claims.

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

1. A structure of the character stated, comprising outer and inner pier-blocks, said inner blocks having inwardly inclined upper ends, wedge-blocks adapted to fit upon said inclined ends to provide level upper faces on the piers, skew-backs fitting upon said faces and formed with inwardly beveled seats, and voussoirs abutting against said seats and forming an arch.

2. A structure of the character stated, comprising outer pier-blocks, inner pier-blocks shorter than said outer blocks and having inwardly inclined upper ends, wedge-blocks fitting upon said inclined ends to form level faces with the ends of the outer blocks, skew-backs fitting upon such faces and having outwardly inclined upper

sides and inwardly beveled seats having a similar incline as said upper sides, and voussoirs abutting against said seats and forming an arch.

3. A structure of the character stated, comprising pier-blocks having obliquely-diverging inner faces, skew-backs seated upon the upper ends of said pier-blocks and having outwardly inclined upper sides and inwardly beveled seats having a similar incline as such sides and formed with flaring beveled faces below said seats, and voussoirs abutting against said beveled seats and forming an arch.

4. In a structure of the character stated, a skew-back formed with an outwardly inclined upper side, an inwardly beveled seat having a similar incline as said side, and beveled triangular faces below said seats.

JAMES WARNER.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."