No. 773,149. PATENTED OCT. 25, 1904.

G. L. JUNGE.

ARCH CONSTRUCTION.

APPLICATION FILED MAY 11, 1904.

NO MODEL.

Fig. 1.

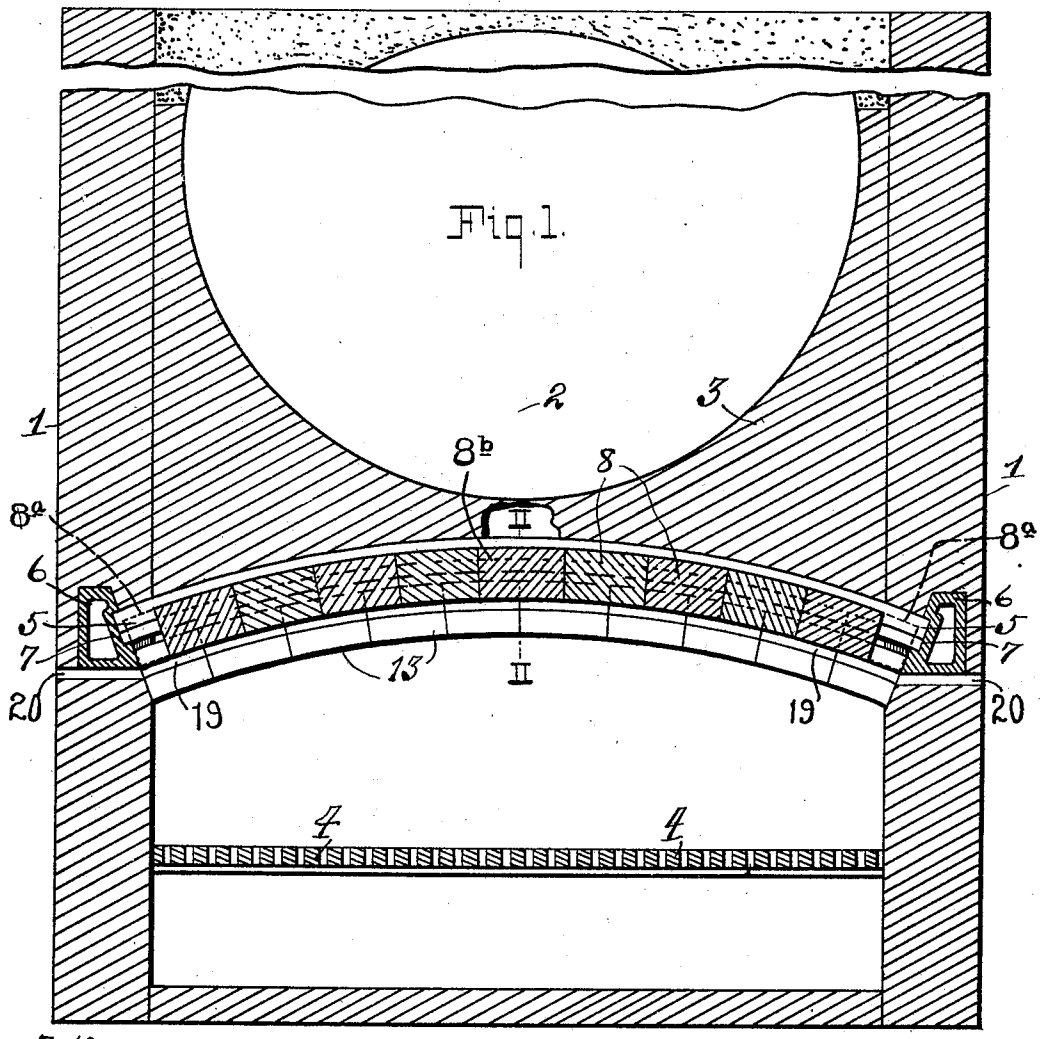


Fig. 2.

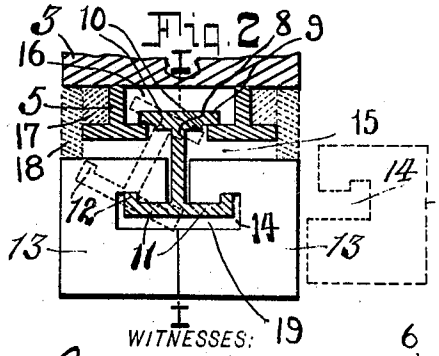


Fig. 3.

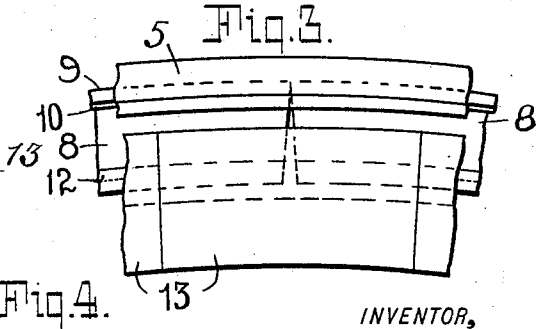
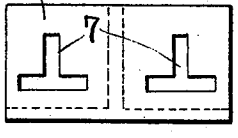


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE L. JUNGE, OF PITTSBURG, PENNSYLVANIA.

ARCH CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 773,149, dated October 25, 1904.

Application filed May 11, 1904. Serial No. 207,376. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. JUNGE, a citizen of the United States, residing at the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered new and useful Improvements in Arch Construction, of which the following is a specification.

In the accompanying drawings, Figure 1 is a cross-sectional view of a boiler-furnace along the line I I in Fig. 2. Fig. 2 is a detail view in section along the line II II in Fig. 1. Fig. 3 is an enlarged broken front elevation of my arch construction, and Fig. 4 is a front view of my improved skewback.

My invention consists of certain new and useful improvements in arch construction, and is especially applicable to baffle-wall construction for furnaces, although its adaptability in any character of archwork is evident.

It consists, briefly, of supporting members reaching from side wall to side wall and having suspended therefrom secondary supporting members, from which a protecting-facing of a refractory material may be suspended.

I have described my invention as more particularly applied to arched work, but its use in constructing a flat as well as a convex arch is evident, and I wish to include the same within the purview of this application.

In the accompanying drawings, which are merely illustrative of the principles of my invention and not intended as limiting the same, 1 1 are the side walls of a furnace, 2 a boiler supported by said furnace in the usual manner, and 3 is the baffle-wall extending in the usual manner from side wall to side wall and preferably built up around the periphery of the boiler 2. Said baffle-wall is supported by my novel arch construction.

4 4 are the grate-bars of any usual design.

5 5 are inverted T-irons, which are sprung across from side wall to side wall and in case of a convex arch having the desired curvature. The extremities of T-irons 5 5 are secured in and held firmly in place by skewbacks 6 6, which have recessed seats 7 7 in their fronts of the proper contour to receive the extremities of T-irons 5 5. Said skewbacks are preferably metal castings of proper shape to be conveniently and rigidly built into the side walls of the furnace and may be of hollow construction, as shown in section in Fig. 1. The baffle-wall 3 is built up, as shown, above the inverted T-irons 5 5 of any suitable refractory material. 8 8 are sections of I-beams having top flanges 9 9, which are cut away somewhat on their lower faces to form shoulders 10 10. The lower flanges 11 11 are preferably somewhat wider than the top flanges 9 9 and are provided at their edges with upwardly-extending lips 12 12. The said I-beams are inserted between the inside flanges of the T-irons 5 5 by tipping, as indicated in dotted lines in Fig. 2, and the shoulders 10 10 serve to prevent their displacement by lateral movement. The I-beams are made in lengths convenient to handle and are curved longitudinally to conform to the curvature of the T-irons.

13 13 are tile or brick of suitable refractory material and of the design illustrated in Fig. 2. They are provided with L-shaped recesses 14 14 to engage the flanges 11 11 and lips 12 12 of the I-beams 8 8, which recesses are, however, somewhat larger than the flange and lip to enter the same, thus allowing a tile to be suspended from each flange 11 of an I-beam section by inserting the tile in place from the somewhat elevated position shown in dotted lines in Fig. 2. The upper portion of the tile is of a somewhat less width than the lower portion to allow for the vertical web of the I-beam and expansion of the parts, this latter being an additional benefit desired from the enlargement of the recesses in the tile.

To assemble the arch, I suspend a sufficient number of I-beam sections from the T-irons, as shown, to extend from side to side of the arch and where, as shown in the drawings, the I-beam sections and tile are of the same length I break joints between I-beams and tile by making the end sections 8^a 8^a of the I-beams of half the usual length, thus forming a key I-beam 8^b in the center of the arch, beneath the center of which will come the joint between two tile. The tile are now slid into place on each side of the I-beams. The

space 15 between the lower faces of the T-irons and the lower faces of flanges 9 9 of the I-beams may be filled with a packing of asbestos and clay, which will allow for expansion and contraction of the various members of the construction. A like filling may, if desired, be placed in space 16 just above. Fire-brick 17 are then built in between the top of the outer flanges of the T-irons and the bottom of the baffle-wall 3, said space being preferably of proper heighth to accommodate a brick set on edge. Similar fire-brick 18 are built up from the top of the tile to the opposing bottom of the baffle-wall.

It is evident that by knocking out the brickwork 18 any desired tile may be removed at will for repairs or replacement, and by removing the tile suspended therefrom and knocking out the bricks 17 on both sides any desired section of I-beams may be removed at pleasure. It is thus evident that my arch construction may be renewed at any time. The space 19 below the lower flanges of the I-beams is preferably left vacant and may be connected with the open air at the outside of the boiler by means of apertures 20 20 through the side walls 1 1 for the sake of coolness.

I may vary my construction in many ways without departing from the principle thereof—as, for instance, substituting inverted angle-irons with inwardly-extending flanges for the T-irons 5 5—which practically amounts to omitting the outside flanges of the T-irons and using a brick filling 18 instead of the single brick 17.

Although I have shown my invention particularly applied to furnace-work, it is applicable to all forms of flat or convex arch constructions, and by constructing adjacent or abutting arches of any number and contour I very easily construct an arch of any desired length and width.

Although I have for the sake of clearness minutely described the construction illustrated in the drawings, I do not wish to limit myself thereby; but

I claim, broadly—

1. In arch construction, a pair of cross supporting members, inwardly-extending flanges on the lower edges of said members, secondary members hung lengthwise between said cross supporting members by means of lateral flanges engaging the flanges of said cross supporting members and a covering of refractory material hung from said secondary members.

2. In arch construction, a pair of parallel cross supporting members, inwardly-extending flanges on the lower edges of said cross supporting members, I-beam sections hung lengthwise from said inwardly-extending flanges by means of the top flanges of said sections and units of refractory material hung from the lower flanges of said I-beam sections.

3. In arch construction, a pair of cross supporting members, sections of I-beams hung lengthwise between said cross supporting members by means of their top flanges, upwardly-extending lips on the lower flanges of said I-beam sections and units of refractory material adapted to be hung from said I-beam sections and recessed to engage said lower flanges and said lips.

4. In arch construction, flanged cross supporting members, I-beam sections hung lengthwise by means of their upper flanges between said cross supporting members, upwardly-extending lips on the lower flanges of said I-beam sections, units of refractory material hung from either lower flange of said I-beam section and provided with L-shaped recesses adapted to engage the lower flange and lip.

Signed at Pittsburg, Pennsylvania, this 3d day of May, 1904.

GEORGE L. JUNGE.

Witnesses:
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