W. E. GEHRING.

SUSPENDED ARCH FOR BOILERS AND THE LIKE.

APPLICATION FILED MAY 12, 1919.

1,328,511.

Patented Jan. 20, 1920.

2 SHEETS—SHEET 1.

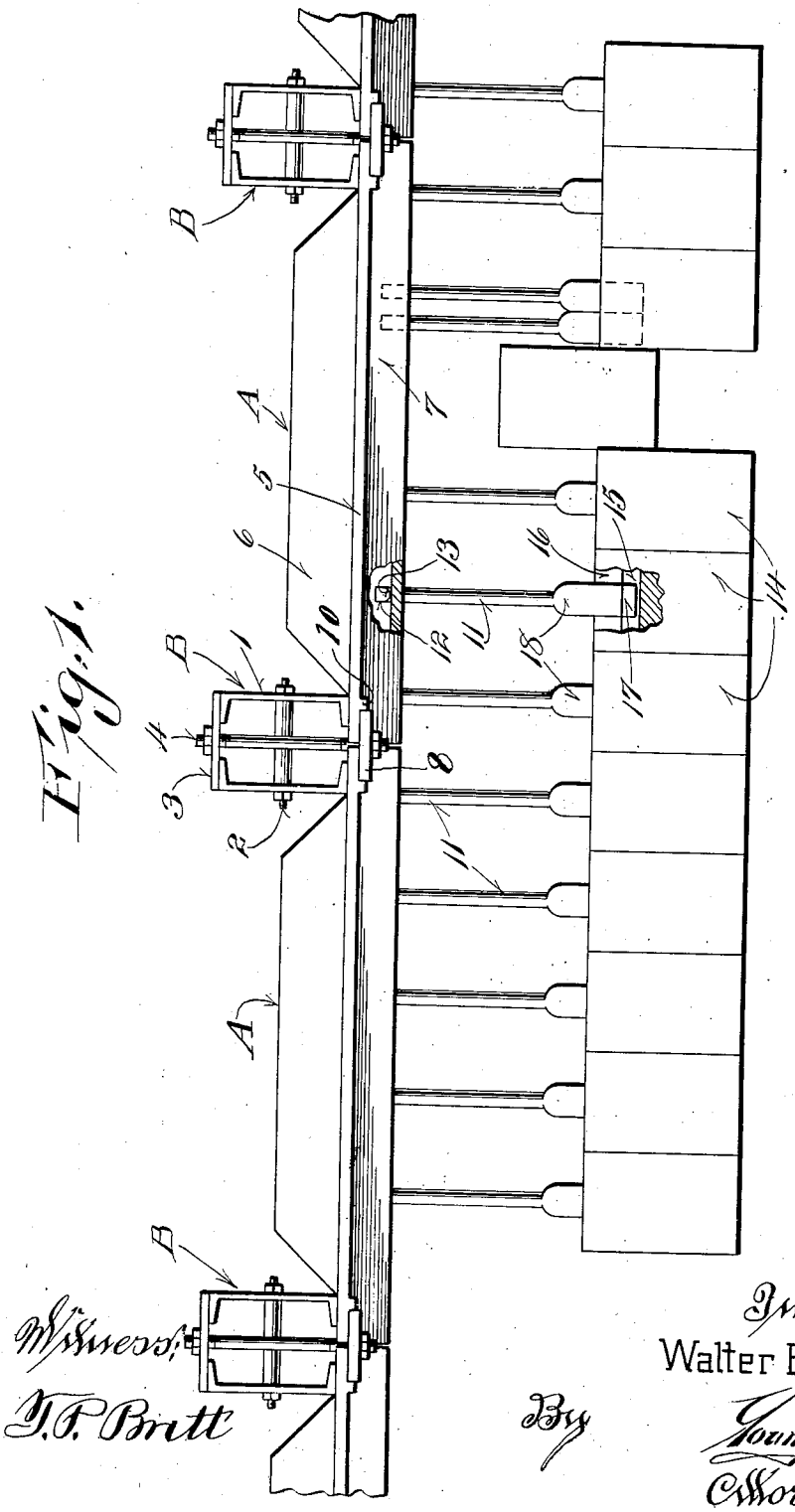


Fig. 1.

Witness:
T. P. Britt

Inventor
Walter E. Gehring
By Young & Young
Attorneys

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2 SHEETS—SHEET 2.

Fig. 3.

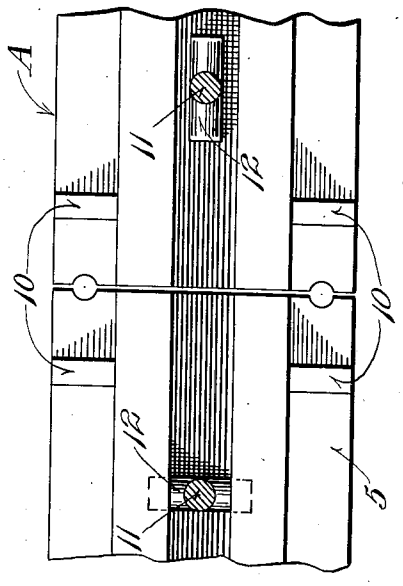


Fig. 4.

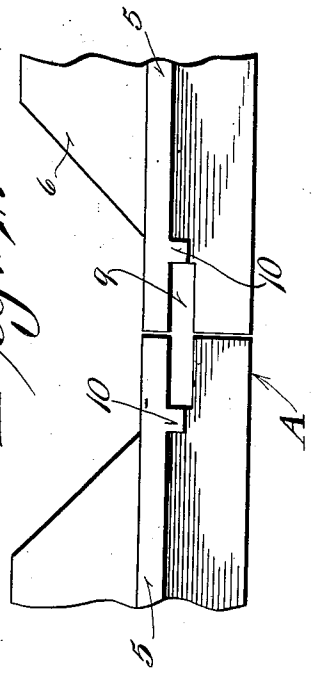
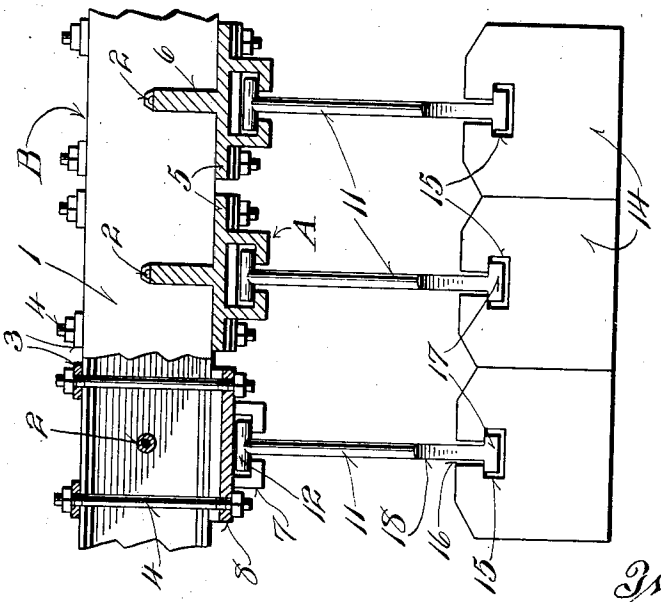


Fig. 2.



Witness

T. F. Britt

Inventor

Walter E. Gehring

By Young & Young,

Attorneys

UNITED STATES PATENT OFFICE.

WALTER E. GEHRING, OF MILWAUKEE, WISCONSIN.

SUSPENDED ARCH FOR BOILERS AND THE LIKE.

1,328,511. Specification of Letters Patent. Patented Jan. 20, 1920.

Application filed May 12, 1919. Serial No. 296,446.

To all whom it may concern:

Be it known that I, WALTER E, GEHRING, a citizen of the United States, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Suspended Arches for Boilers and the like; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention pertains to improvements in the means for mounting the linings of furnaces, kilns and the like, and refers particularly to means for suspending the arches of such types of apparatus.

The arches and other parts of lining of furnaces and the like are ordinarily constructed of a plurality of fire bricks, and under modern practice it is customary to mount or suspend the same in spaced relation to the main supporting means in order to prevent the latter from being readily burnt out. When arches are so supported, a considerable number of the lining bricks are suspended from a single hanger so that when it is necessary to replace a single one of the bricks, all of the others on this particular hanger must be removed. As many of the bricks removed are rendered useless, the replacement of the single defective brick is an expensive procedure. The same is true when the hanger on which a plurality of bricks is suspended is burnt out, or needs replacing for any other reason.

It is therefore the principal object of this invention to provide means whereby the several lining or arch bricks may be individually suspended. This obviously permits the removal of a single brick without interfering with any of the other bricks comprising the lining or arch.

With these general objects in view, the invention consists in the novel features of construction, combination and arrangement of parts hereinafter described and claimed and which are shown in the accompanying drawing, wherein:

Figure 1 represents an elevational view of a supporting means for a plurality of arch bricks, each of which is individually suspended.

Fig. 2 is a transverse sectional view through the main supporting means, the arch bricks and their hangers being in elevation.

Fig. 3 is a lower plan view of the abutting ends of two elements of the main supporting frame, a pair of hanger bars to be associated therewith being in transverse section, and

Fig. 4 is a detail elevational view of the parts shown in Fig. 3.

Inasmuch as my invention is capable of use in many types of furnaces, kilns and analogous apparatus, the use of the same in any particular application has not been illustrated in the accompanying drawings. It is also to be understood that various changes may be made in the form and proportion of the several parts of the invention and in the manner of using the same, without departing from the principles thereof as outlined in the succeeding description and in the claims.

Referring more particularly to the drawings, it will be seen that when the invention is used for supporting arch brick, a plurality of supporting frames A are carried by longitudinal or transverse beams B, which beams are preferably rigidly secured at their opposite ends in the boiler or furnace wall. Each of the beams B preferably comprises a pair of vertically disposed channeled bars 1 having their corresponding faces opposed and secured in spaced relation by transverse spacing bolts 2. At a plurality of points on the bars 1 are located upper transverse tie plates 3 which carry tie rods 4 by which the frames A are secured to said beams B.

Each of the supporting frames A consists of a plurality of sections, one of which is located between each adjacent pair of beams B as most clearly shown in Fig. 1. Each of the several frame sections is shown in the accompanying drawings as having its several parts cast integrally, said parts including an elongated horizontal plate 5, a vertical reinforcing rib 6, and a pair of depending angle bars 7 which extend parallel to each other throughout the length of the plate 5 and have their like faces opposed, thus forming an elongated chamber running from one end of the section to the other. The angle bars 7 have their adjacent horizontal flanges spaced apart to provide an elongated passageway into said chamber.

The ends of the several sections of the frames A are secured to the under sides of the beams B by means of said tie rods 4 and lower tie plates 8 which extend through slots 9 in the bars 7 as shown in Fig. 4. Lugs 10 on the plates 5 engage the opposite sides

of the lower tie plates 8 to aid in constructing a rigid joint between the several frame sections and the adjacent beams. The several frame sections being alined, the chambers resulting from the spacing of the angle bar 7 are likewise alined and extend from one end to the other of each of the frames A.

The fire bricks which form the arch or boiler lining are adapted to be spaced from the frames A and individually suspended therefrom by a plurality of hanger bars 11. Each of the hanger bars 11 has a T-head 12 of a width less than the distance between the horizontal flanges of the angle bars 7 and of a length which is greater than said distance. Thus said heads may be readily disposed within the chamber defined by said angle bars 7 by first alining the same with the angle bars and then rotating the hanger bars 11 to dispose said heads transversely. These two positions of the heads are indicated in Fig. 3. The portions of the heads 12 which engage the horizontal flanges of the angle bar 7 are preferably rounded as indicated at 13 to procure a uniform seating and evenly distribute the strain exerted by the weight of the bricks carried by the hanger bars.

Each of the bricks 14 is preferably rectangular, or substantially so, and is provided with a T-shaped slot 15, the ends of which open through the opposite sides, while one portion opens through the intermediate side as indicated at 16. When the bricks are used in an arch the openings 16 are at the tops thereof, and the other portions of the slots 15 are substantially horizontal.

The ends of the hanger bars which engage in said slots 15 are T-shaped as at 17, the shank portions of said ends being flattened as at 18. This arrangement allows the hanger bars to have their T-shaped ends 17 slid the length of the slots 15, while preventing rotation of the bars with respect to the bricks, or vice versa.

In building an arch in accordance with my invention, a number of hanger bars 11 are suspended from each of the several frames A, the number of bars 11 depending upon the number of bricks which are to comprise the arch. The T-shaped end 17 of each of the hanger bars then has a brick 14 disposed thereon. Upon proper shifting of the hanger bars and the bricks, the latter will be arranged so that their adjacent faces will be in abutting relation. A greater accuracy of adjustment is obviously obtained by having each brick individually suspended and a more neatly constructed and efficient arch is thus procured than would result from ordinary and standard construction.

When it becomes necessary to remove one of the bricks, or one of the hangers, the proper hanger bar 11 is shifted longitudinally of its supporting frame A toward the next adjacent hanger bar, thus disposing its T-shaped end 17 in the slot of the adjacent brick as shown in Fig. 1. The defective brick may then be lifted out of the arch or allowed to drop into the fire box as desired. The operations of replacing a brick are of course the reverse of those just set forth. After a brick is detached from its hanger bar, the latter may be removed from its supporting frame A by rotating it to aline the head 12 with the angle bars 7 as was hereinbefore particularly set forth.

I claim:

1. A structure of the class described comprising a support including a longitudinally extending member, a plurality of hangers carried by the member and slidable longitudinally thereof, each of said hangers having a block holder, and a like number of blocks, each having a holder receiving slot opening through opposite sides thereof, said slots being alined, each of said blocks being detached from its respective hanger by sliding the block holder of the latter out of the slot of the former beyond either end of the same until said hanger is out of the vertical planes of the sides of the block.

2. A structure of the class described comprising a support including a longitudinally extending member, a plurality of hangers carried by the member and slidable longitudinally thereof, a block holder on each of said hangers, each of said block holders having a flattened portion, whereby the same is of greater width than thickness, and a plurality of blocks, each having a slot of less width than the flattened portion of the block holders and receiving the same, said blocks being alined, the flattened portion of the block holders being slidable and non-rotatable in said slots.

3. A structure of the class described comprising a support including a substantially longitudinally slotted plate, a plurality of hanger rods, each of said rods having one end laterally turned and engageable with the slotted plate by alining the end with the slot therein and then moving the same out of alinement, a block holder on the end of each rod opposite the laterally turned end thereof, and a like number of blocks, each having a slot receiving a block holder, said slots being alined, said hanger rods being slidable longitudinally of the plate through the slot therein, the block holders being similarly slidable through the alined slots in the blocks.

4. A structure of the class described comprising a support including a substantially longitudinally slotted plate, a plurality of hanger rods carried by the plate and slidable longitudinally thereof through the slot, each of said rods having a laterally turned end engageable through the slot of said

plate by alining the end therewith and then moving the same out of alinement with the slot, and a plurality of blocks, one being slidably and non-rotatably carried by each of said hanger rods, said blocks being rectangular and disposed in abutting relation, thereby preventing rotation thereof and of the hangers.

5. A structure of the class described comprising a substantially horizontal frame, a tie plate carried by the frame, a pair of supporting frames each consisting of an elongated plate and a pair of spaced opposed angle bars, said supporting frames being alined and having slots formed in the adjacent end portions of the angle bars thereof to receive said tie plate, the adjacent portions of the elongated plates being disposed between the beam and the tie plate, a plurality of hangers slidably carried by said angle bars and disposed therebetween, and a like number of blocks mounted one on each of said hangers.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee, in the county of Milwaukee and State of Wisconsin.

WALTER E. GEHRING.