G. E. MAXLOW & A. VAN VLIET.

FURNACE ARCH.

APPLICATION FILED MAR. 25, 1911.

1,006,111. Patented Oct. 17, 1911.

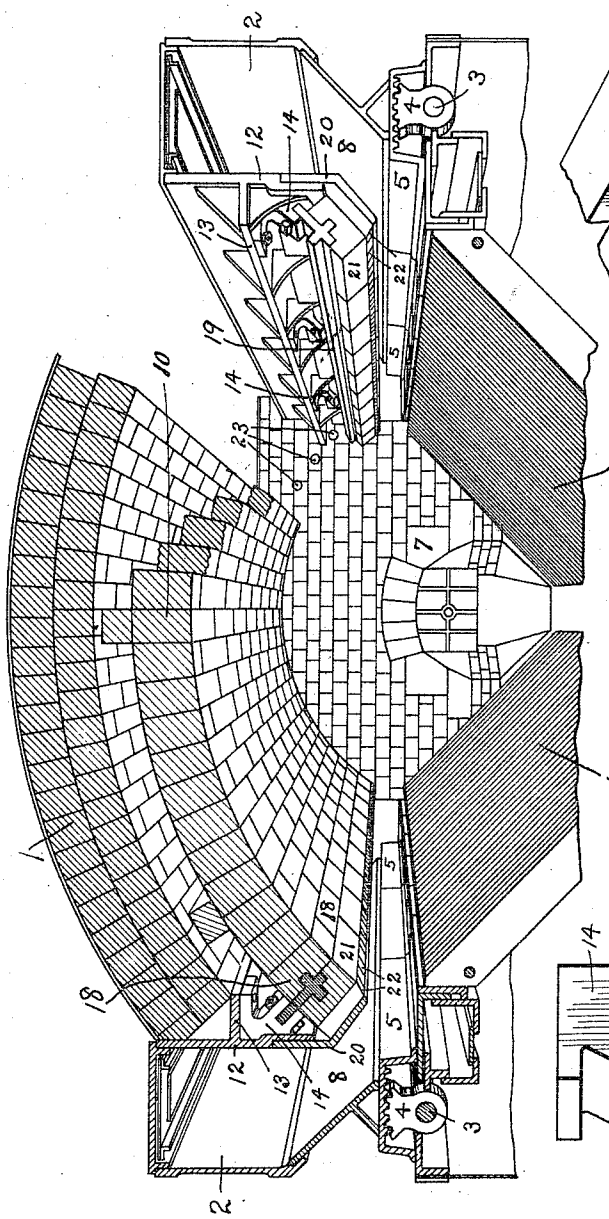

Fig. 1.

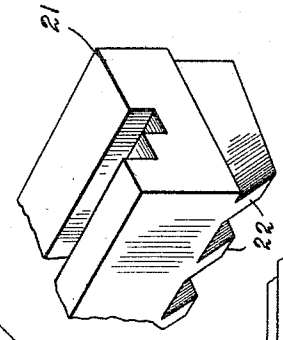

Fig. 3.

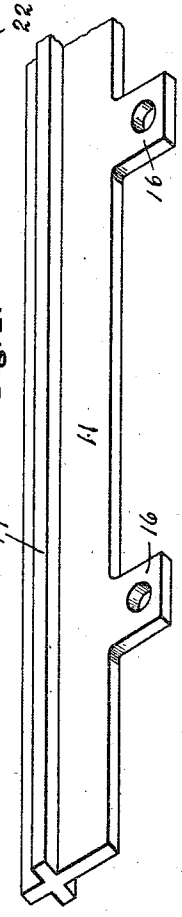

Fig. 4.

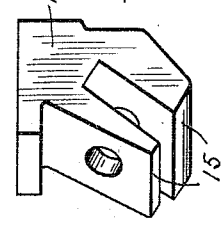

Fig. 2.

Witnesses

Albert A. Hofmann

Elizabeth M. Brown.

Inventors

George E. Maxlow.

and Arthur Van Vliet.

By Edward N. Pagelsen,

Attorney

UNITED STATES PATENT OFFICE.

GEORGE E. MAXLOW AND ARTHUR VAN VLIET, OF DETROIT, MICHIGAN, ASSIGNORS OF ONE-HALF TO DETROIT STOKER COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

FURNACE-ARCH.

1,006,111. Specification of Letters Patent. Patented Oct. 17, 1911.

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To all whom it may concern:

Be it known that we, GEORGE E. MAXLOW, a subject of the King of Great Britain, and ARTHUR VAN VLIET, a citizen of the United States, and residents of Detroit, in the county of Wayne and State of Michigan, have invented a new and useful Furnace-Arch, of which the following is a specification.

The invention relates to an improvement in steam boiler furnaces, and more particularly that type of furnace wherein the fuel is fed from the sides of the furnace onto the inclined grate bars. In this type of furnace, the fuel is usually stored in magazines at the side and the coking thereof takes place adjacent the upper end of the grate bars. In such furnaces, it has been ascertained that in connection with the interior arch of the furnace, there is more or less variation, owing to heat conditions, especially at the abutments. These abutments have in the past been supported on the magazine wall and when the abutments became warped or cracked, owing to expansion and to the action of the heat, it has been necessary to remove the entire wall of the magazine and replace the same.

The present invention has for its object the placement in the furnace of a removable arch abutment in the form of a metal member and to place and support between the member and the interior of the furnace, a removable protective member, the latter being held adjacent to the mouth of the magazine. The protective members being located as stated, are naturally affected by the heat and become distorted or burned out, however the same can be readily replaced or removed without the necessity of removing or displacing the arch support or abutment. By the construction also, the magazine wall is protected and prevented from warping or cracking while the arch has freedom of expansion longitudinally of the furnace without interfering with the supporting parts which supporting parts are protected by independently removable members.

We have shown in the accompanying drawing, an embodiment of the invention, but desire it understood that changes can be made without departing from the nature and principle thereof.

In the accompanying drawings, Figure 1 is a view of the interior of a furnace showing the improved arch construction. Fig. 2 shows a retaining device for the bar shown in Fig. 4. Fig. 3 is a perspective of a refractory block. Fig. 4 is a view of a supporting bar.

Similar reference characters refer to like parts throughout the several views.

The construction shown in Fig. 1 is that of a Murphy furnace and stoker having an outer arch 1, spouts 2 for the coal, feeder shafts 3, segments 4 to move the pushers 5, grate bars 6, and end wall 7. This construction has long been in use and forms no part of our present invention. The fuel is fed into the spouts 2 and slides down the inclined sides 8 by gravity. The pushers 5 move laterally, from the positions shown in Fig. 1, inwardly, pushing the fuel before them onto the grate bars 6, down which it slowly slides. The result is a coking of the coal and a burning of the gases adjacent the springings of the interior arch 10, which is built in to save the outer arch 1, and is usually of fire brick.

While any desired means may be employed to sustain the supporting arch-abutment bar 11 which extend lengthwise of the furnace, the construction shown in the drawing is preferred for the type of furnace shown. The front plates 12 of the spouts 2 may be provided with flanges 13, properly reinforced, to which flanges are connected the blocks 14 having jaws 15. The bars 11 are cross-shaped in section and have tongues 16 adapted to extend between the jaws 15, bolts extending through holes in the jaws to secure the bars in position. The number of these blocks 14 will depend upon the weight to be carried and the proportions of the parts.

The line of blocks 18 of each springing will be formed with a groove to receive one rib 19 on the bar 11. Angled plates 20 will extend inwardly as shown in the drawing and support the refractory blocks 21 having grooves for the supporting abutment bars. These blocks have tongues 22 which rest on the plates 20. The air which may enter at the end of the furnace through openings 23, passes along between the arches 1 and 10 and then down and through the spaces between the tongues 22 of the blocks 21. The air meets the hot gases formed by coking the coal on the grate bars, and the burning of

the gases produces great heat which finally destroys the lower lines of bricks of the arch 10. By supporting the main arch 10 by means of abutment bars which are completely protected, the crumbling of the lower lines of bricks will not rob the arch of its support. Sudden collapse is therefore avoided, for the line of blocks 21 can be easily replaced without tearing down the arch and may therefore be renewed whenever deterioration is found.

Having now explained our construction, what we claim as our invention and desire to secure by Letters Patent is:—

1. In a furnace arch construction, in combination with the side walls, of an inwardly projecting bar at each springing of the arch extending parallel to the line of the arch, said bar having ribs, an arch of refractory blocks supported by said bars, the lower lines of the blocks at the springings having grooves to receive said ribs, and plates supported by the walls to carry the lowest lines of blocks.

2. In a furnace arch construction, in combination with the side walls, of an inwardly projecting bar at each springing of the arch extending parallel to the line of the arch, said bar having ribs, an arch of refractory blocks supported by said bars, the lower lines of the blocks at the springings having grooves to receive said ribs, and plates supported by the walls to carry the lowest lines of blocks, said blocks having transverse grooves to permit air to pass across the inner faces of said plates.

3. In a furnace arch construction, in combination with the side walls, of inwardly projecting longitudinally ribbed bars at the springings of the arch, which bars extend parallel to the line of the arch, means secured to said walls to carry said bars, grooved blocks resting on said bars, an arch of blocks extending between said grooved bars and carried thereby, a line of blocks extending along beneath each bar and having transverse grooves in their lower faces, and means to hold said blocks in position.

4. In a furnace arch construction, the combination with the side walls and a horizontal longitudinally-extending plate connected to each wall, of a series of blocks secured to said plate and having jaws, an inwardly and downwardly extending bar carried by said jaws at each springing of the arch and extending parallel to the line of the arch, said bar having ribs, an arch of refractory blocks supported by said bars, a line of blocks extending along the lower side of each bar and having grooves transverse to the arch on their lower sides, and plates supported by the walls to carry said transversely grooved blocks.

In testimony whereof, we have signed this specification in the presence of two subscribing witnesses.

GEORGE E. MAXLOW.
ARTHUR VAN VLIET.

Witnesses:
H. D. MacDonald,
Irene D. MacDonald.