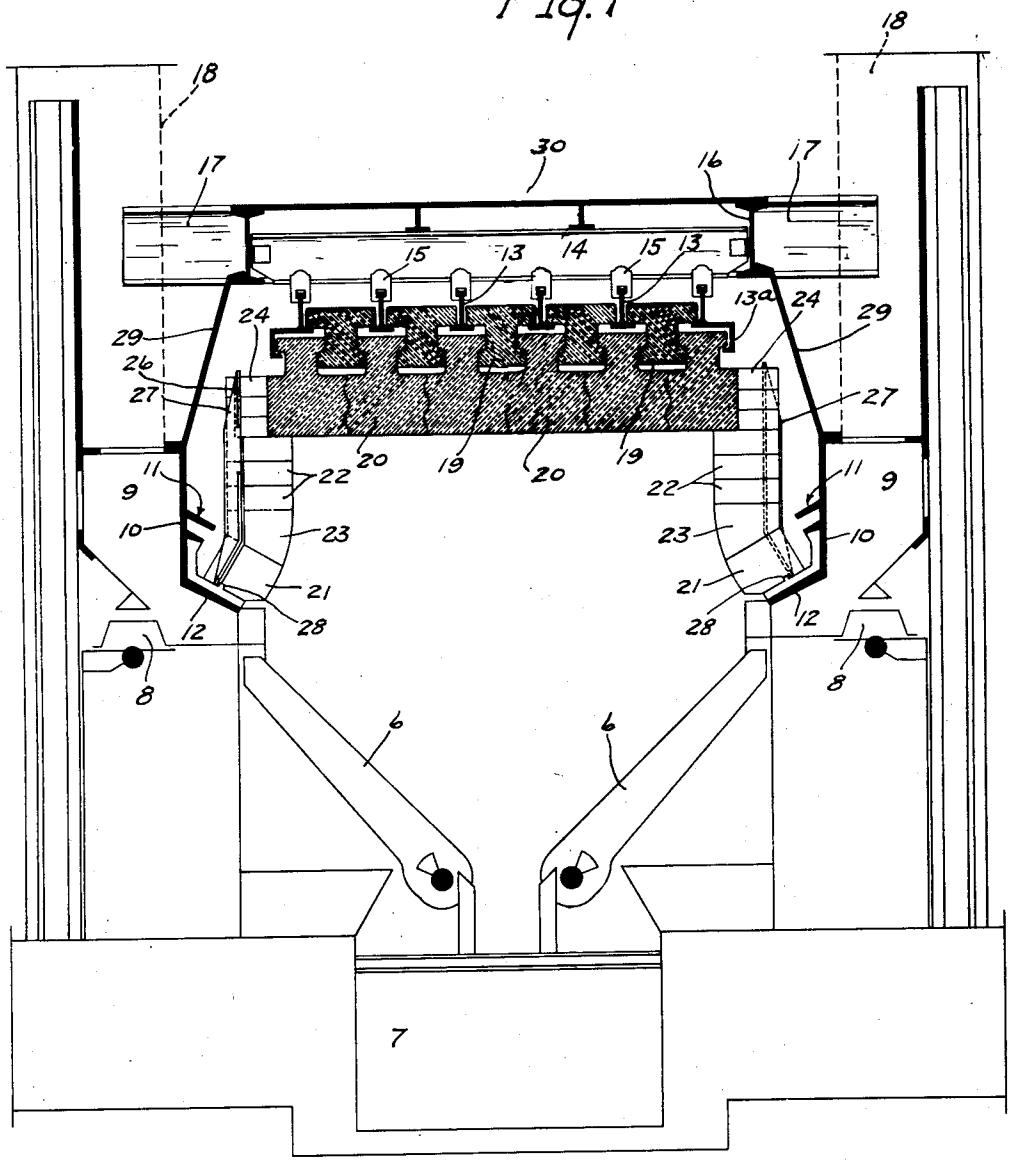
Sept. 13, 1927. 1,642,254

M. LIPTAK

BAFFLE WALL FOR FURNACES

Filed Dec. 8, 1919 2 Sheets-Sheet 1

Fig. 1



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Fig. 5

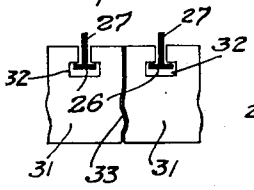


Fig. 4

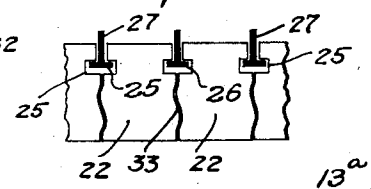


Fig. 2

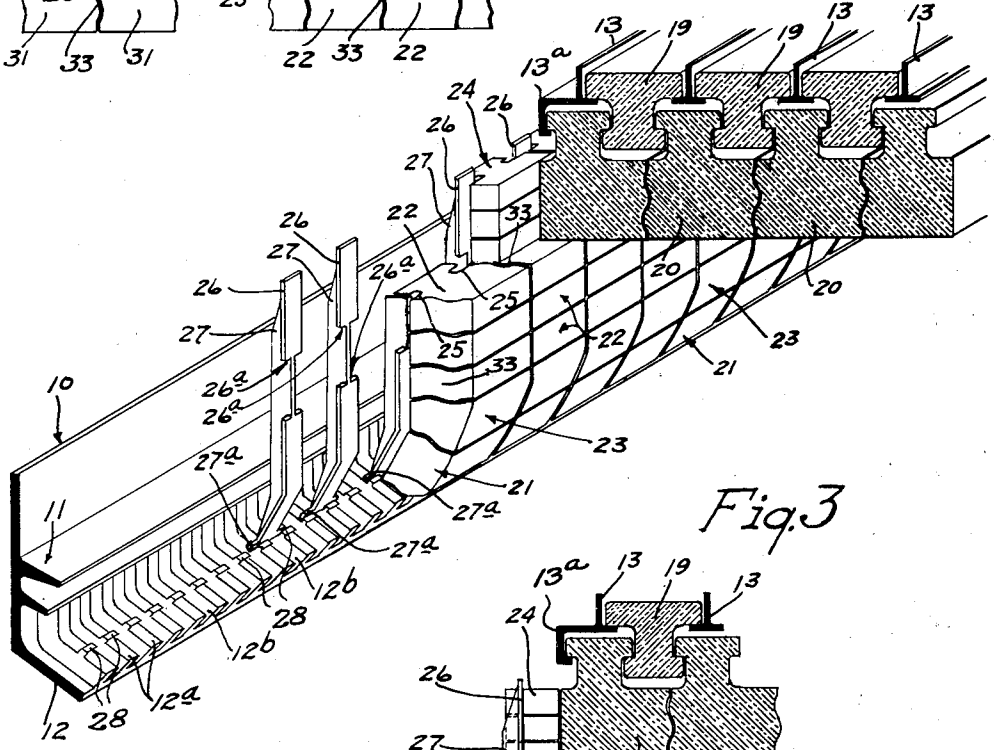
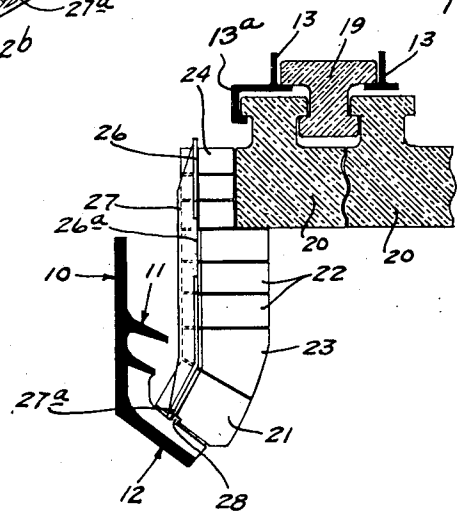


Fig. 3



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Patented Sept. 13, 1927. 1,642,254

UNITED STATES PATENT OFFICE.

MICHAEL LIPTAK, OF ST. PAUL, MINNESOTA, ASSIGNOR TO LIPTAK FIRE BRICK ARCH CO., OF MINNEAPOLIS, MINNESOTA, A CORPORATION OF MINNESOTA.

BAFFLE WALL FOR FURNACES.

Application filed December 8, 1919. Serial No. 343,339.

My present invention relates to furnace arches, and more particularly, to that type of arch in connection with which side baffle walls are employed in association with what is known as side feed stokers, and the invention is directed primarily to the improvement of the baffle walls and to the combination thereof with the arch whereby the blocks or fire brick tiles of the baffle walls may be more efficiently supported and more easily applied and replaced when burned away without disturbing the blocks of the arch.

Generally stated, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

My improved baffle walls are adapted to be readily applied to all, or nearly all of the now existing side feed stokers, certain of which, as hitherto constructed, have had the following characteristics, to wit: arch supporting abutments in the form of flanged metal beams being suitably supported in position to support two concentrically curved arches spaced apart to afford an air space therebetween. In such structures, however, each arch was a complete structure in which no one block could be replaced without breaking down the entire arch, and moreover, if one of the abutment-forming beams was burned away so that it had to be replaced, the entire arch would have to be taken down, even though the blocks of the arch were still in good condition.

My invention provides an arch and baffle wall structure in which the blocks of either may be readily replaced without disturbing the other, and in which, moreover, if one of the abutment beams should be burned and require replacement, this may be done without disturbing the arch, and simply by removal of the blocks of the baffle wall supported by the beams to be replaced.

The arch and the baffle walls have independent supports. The arch is supported by an overhead beam structure, while the baffle walls are built upon and supported by the abutment beams and the blocks are held aligned by the interlocked and flanged ribs which are preferably cast members. The wall supporting flange of the abutment beam is formed with ribs with intervening air passages, and in fact, the abutment beams now in general use are thus formed, so that they afford a proper support for the abutment walls and provision for the passage of air under the abutments walls. The lower ends of the ribs are locked to the ribs of the abutment beams against sliding movements. The preferred arrangement of these features will be hereinafter more fully described.

The abutment walls involve novel features, per se. The arch, so far as this invention is concerned, may take various forms, but is preferably of the general type disclosed and broadly claimed in my application S. N. 216,152, filed February 9, 1918 and allowed November 26, 1919, now Patent No. 1,326,752.

The commercial embodiment of my invention is illustrated in the accompanying drawings wherein like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a view partly in transverse vertical section and partly in diagram showing the arch designed for application to a furnace equipped with side feed stokers;

Fig. 2 is a section in perspective with some parts removed, illustrating the top and side wall construction shown in Fig. 1;

Fig. 3 is a fragmentary view partly in elevation and partly in transverse vertical section through one of the side walls and a portion of the top of the improved arch; and

Fig. 4 is a fragmentary plan view showing several of the ribs and several of the tiles or blocks of one of the baffle walls; and, Fig. 5 is a view similar to Fig. 4, but illustrating a somewhat modified form of block or tile that may be used in the baffle walls.

The ordinary parts of the furnace structure may be briefly noted as follows: the grate structure 6, the ash pit 7, the reciprocating stoker feed heads 8, fuel feed channels 9, and the abutment beams 10, which latter are supported in the usual way and are formed with arch supporting flanges 11 and 12, the latter being provided on their inclined upper faces with laterally spaced ribs 12^a and between the said ribs, with air channels 12^b. In the customary arrangement, a lower curved arch would be supported on the ribs 12^a of the flanges 12, while the upper arch would be supported on the flanges 11 in such manner that air from between the

two arches would pass into the combustion chamber of the fire box through the air channels 12^b.

In applying my invention to a fire box already equipped with the abutment beams 10, the flanges 11 are not used, but the baffle walls are, as stated, supported on the ribs 12^a.

The blocks of the arch are supported from a beam structure which, in turn, is supported from the furnace walls independently of the structure, and, as shown, this beam structure comprises laterally spaced flanged beams 13, cross beams 14, hanger brackets 15, side beams 16, and main end beams 17, which latter are incompletely shown, but have their ends suitably anchored in the furnace walls 18. The brackets 15 have hung slidably thereon laterally spaced beams 13 and are hung from the flanges of the cross beams 14, and the cross beams 14 at their ends, are secured to the side beams 16, while the ends of said side beams 16 are suitably secured to the main beams 17.

The fire arch shown comprises T-shaped upper or hanger blocks 19, the upper flanges of which rest upon the lower flanges of the beams 13, and lower or underfacing blocks 20 that are formed with T-shaped necks, the flanges of which are hung on the lower flanges of the hanger blocks 19, all as more fully described in my Patent No. 1,326,752. Here, however, it may be noted that the outermost beams 13 are provided with depending flanged webs 13^a that interlap with the outermost upper flanges of the underfacing blocks 20 and serve to hold the side members of said blocks 20 in position when the baffle walls are removed.

The baffle walls are made up of lower blocks or tiles 21, upper blocks or tiles 22, intermediate blocks 23, and filler blocks 24. All of these blocks 21, 22, 23 and 24, in the arrangement illustrated in Figs. 1 to 4, inclusive, are formed, near their outer or back edges with vertical notches 25 that adapt them to interlock with the laterally projecting flanges 26 of baffle ribs 27. Thus, the said blocks are adapted to slide vertically on the flanges 26 to and from proper position. The lowermost blocks 21 will rest directly upon the ribs 12^a of the lower flanges 12 of the abutment beams 10, and at their bottoms, said blocks are formed with notches that adapt them to interlock with lugs 28 on the said ribs 12^a. Here it should also be noted that the baffle ribs 27, at their lower ends, are formed with outstanding lugs 27^a adapted to span the air space 12^b and to engage with the lugs 28 to positively prevent the lower end of the baffle ribs from slipping down and falling into the furnace.

From the foregoing description and illustration of the drawings, it is evident that the lower ends 27^a of the ribs 26 and the lugs 28 form fulcrums on which the side walls are supported and that these fulcrums being outward of the centers of gravity of the walls causes gravity to rock and press said side walls laterally inward and against the fire arch. Also, it will be noted that the ribs form elements of the walls and move with the walls if, in fact, movement is given to the walls. Of course, sufficient pressure will rock the walls away from the arch but such force can be produced only by very considerable power, but if such motion should be intentionally produced for any reason, the ribs would move with the walls. The ribs tie together the blocks of the walls, causing them to act as entireties and, of course, give very great strength to the walls.

The blocks 21, 22 and 23 have such horizontal extensions that they project into the furnace beyond the vertical planes of the outer faces of the outermost arch blocks 20, but the filler blocks 24 have such horizontal projection that they extend only up close against the outer face of said blocks 20. The filler blocks 24 may therefore be applied and replaced at any time while the blocks 21, 22 and 23, as well as the arch blocks, are all in position. When, however, one of the blocks 22, for example, is to be replaced the filler blocks 24 must be removed or held up.

The flanges 26 of the baffle ribs 27 are formed with gaps 26^a which permit the blocks 22 and 23 when raised into alignment therewith, to be applied to or removed from said baffle ribs by horizontal movement, but to replace the lower blocks 21, certain of the blocks 22 and 23 must be removed and then the ribs raised so as to raise and then lower onto a replaced block 21. The uppermost block 22 should come into close engagement with the undersurface of the arch, will simply by slid into position, and while not then interlocked positively with the flanges 26, will, nevertheless, remain in position and all of the other blocks of the baffle wall will be positivey interlocked to the baffle ribs.

From the foregoing it is evident that any or all of the blocks of the baffle walls can be replaced without disturbing the blocks of the arch, and, conversely, the blocks of the arch may be replaced without disturbing the blocks of the baffle walls. Of course, if the whole arch should be removed the baffle walls could be held in position by an interposed temporary brace.

The numeral 29 indicates coal baffle plates that close the space between the beams 10 and 16, leaving the proper air passages between the baffle walls and said baffle plates 29 and beam 10. The air supply, as usual, will preferably be from the front end of the arch and will be delivered to the furnace through the air channels 12^b. The baffle plates 29 will be removably applied so that access may be

had to the baffle walls for the purpose of removal of ribs. The numeral 30 indicates a cover plate applied across the space between the side beams 16. Coal can, of course, be stored over the top of this plate 30 as well as in the space just outside of the baffle plates 29.

In the arrangement shown in Fig. 5, the blocks 31 of the baffle wall, instead of being divided on the line of the baffle ribs, are divided midway between the ribs and are formed with T-shaped grooves 32 that slidably interlock the same to the flanged baffle ribs 27. In both of the constructions described, the adjacent faces of the blocks of the baffle wall are advisably formed by irregular lines, as indicated at 33, so as to cut off the direct air or flame passage from the interior of the furnace to the metallic baffle ribs. Also, these irregular surfaces interlock the blocks so that if one should be broken it would not work out of position.

Directing attention particularly to Fig. 3, it will be noted that the lower ends of the baffle ribs that interlock to the ribs 12^a and afford fulcrums on which the baffle walls can rock, are outward of the centers of gravity of the baffle walls so that the weight of the latter will tend to move the walls inward and will normally press the filler blocks 24 against the outermost underfacing blocks 20 of the arch. This, of course, prevents any possibility of the baffle walls being accidentally forced outward and keeps the baffle walls always in close contact with the arch.

What I claim is:

1. The combination with a furnace arch, of oscillatory baffle wall supports below and at the sides of said arch, baffle walls built up of blocks carried on said supports, the preponderance of weight of said walls being inward of said supports whereby the baffle walls are gravity-pressed toward said arch.

2. The combination with a furnace arch, of oscillatory baffle wall supports below and at the sides of said arch, baffle walls built up of blocks carried on said supports, the preponderance of weight of said walls being inward of said supports whereby the baffle walls are gravity-pressed toward said arch, and metallic ribs interlocked with the blocks of said walls and reinforcing the same.

3. In a furnace, the combination with a furnace arch, of baffle wall supports below and at the sides of said arch, baffle walls made up of blocks carried by said supports, and metallic ribs interlocked with said blocks, said ribs, at their lower ends, being fulcrumed on said supports and the preponderance of weight of the wall being inward of said ribs whereby the baffle walls are gravity pressed toward said arch.

4. In a furnace, the combination with a furnace arch, of oscillatory baffle wall supports below and at the sides of said arch, baffle walls made up of blocks carried by said supports, and metallic ribs interlocked with said blocks and free to move with the walls formed by said blocks, said ribs having flanges with gaps therein permitting certain of the blocks to be applied and removed while said ribs are in working position.

5. In a furnace, the combination with a furnace arch, of baffle wall supports below and at the sides of said arch, baffle walls made up of blocks carried by said supports, and metallic ribs interlocked with said blocks, said ribs, at their lower ends, being fulcrumed on said supports and the preponderance of weight of the wall being inward of said ribs whereby the baffle walls are gravity pressed toward said arch, the wall forming blocks that are below said arch having an inward projection under the arch and the wall blocks that are above the lower surface of the arch having less horizontal inward projection and terminating against the outer members of the arch blocks.

6. In a furnace, the combination with a furnace arch, of oscillatory baffle wall supports below and at the sides of said arch, baffle walls made up of blocks carried by said supports, and metallic ribs interlocked with said blocks and free to move with the walls formed by said blocks, said ribs having flanges with gaps therein permitting certain of the blocks to be applied and removed while said ribs are in working position, the wall forming blocks that are below said arch having an inward projection under the arch and the wall blocks that are above the lower surface of the arch having less horizontal inward projection and terminating against the outer members of the arch blocks.

7. In a furnace, the combination with a furnace arch, of baffle walls carried on fulcrumed supports and gravity held against the sides of said arch.

8. In a furnace, the combination with a furnace arch, of oscillatory baffle wall supports below and at the sides of said arch, and baffle walls made up of interconnected blocks carried on said supports and gravity pressed toward the sides of said arch.

In testimony whereof, I affix my signature.

MICHAEL LIPTAK.