No. 810,228. PATENTED JAN. 16, 1906.

E. E. SLICK.

FURNACE ROOF.

APPLICATION FILED JULY 1, 1904.

Fig. 1.

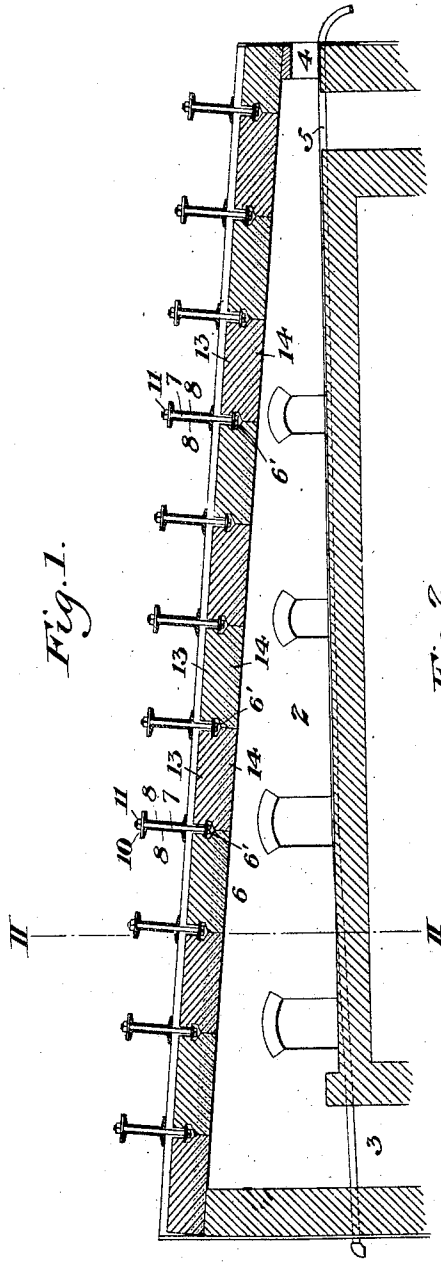


Fig. 2.

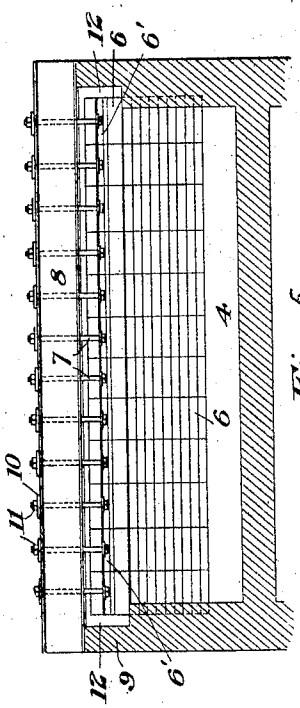


Fig. 3.

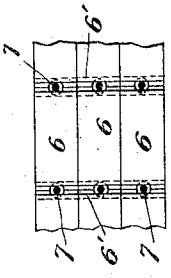


Fig. 5.

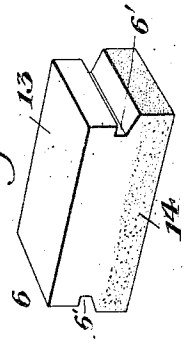
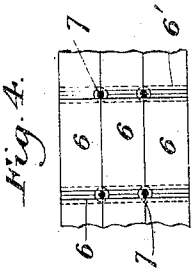


Fig. 4.



WITNESSES

INVENTOR

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UNITED STATES PATENT OFFICE.

EDWIN E. SLICK, OF PITTSBURG, PENNSYLVANIA.

FURNACE-ROOF.

No. 810,228. Specification of Letters Patent. Patented Jan. 16, 1906.

Application filed July 1, 1904. Serial No. 214,961.

To all whom it may concern:

Be it known that I, EDWIN E. SLICK, of Pittsburg, Allegheny county, Pennsylvania, have invented a new and useful Furnace-Roof, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal vertical section showing a heating-furnace provided with my improved roof structure. Fig. 2 is a cross-section on the line II II of Fig. 1 looking toward the right. Fig. 3 is a sectional plan view showing the position of the bolts and bricks. Fig. 4 is a view similar to Fig. 3, showing a modified construction; and Fig. 5 is a detail view of the preferred form of brick which I employ.

My invention relates to the class of furnace-roofs, and is designed to cheapen their structure and reduce their liability to injury and to give more uniform heat to the contained charge. It is also designed to provide for removing and replacing one or more bricks without affecting the remainder of the roof.

In the drawings I show a heating-furnace having the usual chamber 2 with inlet-port 3 at one end for the fuel and opening 4 at the other end, through which the billets are pushed in a row over the water-cooled pipes 5. The roof of this furnace is shown as inclined from one end to the other, although it may extend horizontally or have any desired endwise inclination. It is in the form of a flat arch, the bricks 6 of any transverse row lying in the same general plane. The bricks may be of ordinary construction, except that they are provided at opposite ends with undercut transverse grooves 6′, above which their ends are cut away sufficiently to admit the supporting-bolts 7. The head of each bolt lies in the grooves formed between the ends of the bricks, and the bolts extend upwardly through the cut-away portion and is preferably supported upon a pair of external channels 8, extending transversely and resting upon the side walls 9. The bolts extend up between these pairs of channels and are carried on washers 10, resting on their top flanges.

By reference to Fig. 2 it will be seen that each transverse brick of any row is supported at each end by a bolt engaging it. If it is desired to remove and replace any brick, all that is necessary is to loosen the upper nuts 11 of the bolts engaging the ends of this brick and slide the bolts transversely of the furnace into the grooves of the next brick. The brick may then be disengaged, another one inserted, and the bolts moved back to place and tightened.

In Figs. 1, 2, and 3 I have shown the bolts as located at points intermediate the side edges of the bricks. I may, however, arrange the bolts at other points. Thus in Fig. 4 I show the bolts as at the corners of the bricks, each bolt-head engaging the corners of four bricks, two in each transverse row.

In order to provide for expansion and contraction of the roof transversely, I preferably cut away the side walls, as shown at 12, the transverse row of bricks not completely filling the ledges thus formed. Any transverse expansion or contraction of the metal or brick work of the roof will be taken up by these spaces, thus preventing injurious pressure upon the furnace-walls. Each brick or block is preferably formed of two kinds of material, the upper portion 13 of the brick, which is removed from the heat, being formed of cheap material of the requisite strength, while the lower portion 14 of the brick, which is exposed to the heat, is of a high-grade refractory material. I thus cheapen the cost of the bricks and make them stronger, as the supporting portion can be made of stronger material than the highly-refractory portion.

It will be noted that in my construction each brick is directly carried by engaging a hanger. The bricks may therefore be made all of the same shape without any key-block formation or any interfitting shoulders whereby one brick is supported upon others.

The advantages of my invention result from the peculiar manner of supporting bricks of the roof and also from the air-cooling by reason of the circulation of air around the bolts and through the grooves of the bricks. The bolts fit loosely in the cut-away portions, and the air-circulation will cool the metal of the bolts and give the roof long life. The roof being flat gives an even and uniform heat to all parts of the billets or other charge.

Many variations may be made in the form and arrangement of the furnace, which may be either a heating-furnace, an open-hearth furnace, or of any other type, and the man-

ner of shaping and supporting the bricks may be varied without departing from my invention.

I claim—

1. A metal-heating furnace having a roof inclined longitudinally, said roof being in a substantially flat longitudinal plane; substantially as described.

2. A continuous heating-furnace having a roof lying in a substantially flat plane and inclined longitudinally from one end of the heating-chamber to the other; substantially as described.

3. A heating-furnace roof containing rows of thick bricks with recesses in their side faces intermediate of the height of the brick-body, and depending hangers having a row of separated supports engaging the recesses of adjacent bricks; substantially as described.

4. A heating-furnace roof containing rows of thick bricks with recesses in their side faces intermediate of the height of the brick-body, and depending hangers having separated supports engaging the recesses of adjacent bricks, the hangers being movable endwise of the row to move the support away from a brick and allow it to be removed; substantially as described.

5. A heating-furnace roof having rows of thick bricks with registering recesses in their side faces forming a continuous air-channel along the row, and hangers having a row of separated supports arranged to engage the recesses of adjacent bricks; substantially as described.

6. A heating-furnace roof having bricks with cut-away upper portions, and having side faces with transverse grooves extending across them, and bolts or hangers having a row of separated supports engaging the recesses of adjacent bricks; substantially as described.

7. A heating-furnace having a roof inclined longitudinally and formed of bricks lying in a substantially flat plane longitudinal of the furnace; substantially as described.

8. A heating-furnace having a roof inclined longitudinally in a substantially flat plane, said roof being made up of bricks suspended by overhead hangers; substantially as described.

9. A continuous heating-furnace having a roof lying in a substantially flat plane, and comprised of bricks suspended by overhead hangers, the furnace-chamber being contracted gradually in vertical height from one end toward the other, said furnace having an inlet and outlet at or near its opposite ends to receive a continuous row of metal blanks; substantially as described.

10. A continuous heating-furnace having a substantially flat roof formed of bricks suspended by overhead hangers, said roof being longitudinally inclined toward the floor of the furnace-chamber, said furnace-chamber having an inlet at one end leading from a source of heat, and an inlet at or near the other end to receive the row of metal blanks; substantially as described.

11. A continuous heating-furnace of longitudinal tunnel-form, having a substantially flat longitudinally-inclined roof, an inlet for metal blanks at or near the smaller end of the furnace-chamber, and an outlet for blanks of the row at or near the larger end, said furnace-chamber having a gaseous inlet at or near the larger end and a gaseous outlet at or near the smaller end; substantially as described.

In testimony whereof I have hereunto set my hand.

EDWIN E. SLICK.

Witnesses:
C. P. BYRNES,
H. M. CORWIN.