

Jan. 16, 1940.

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2,187,669

FURNACE ROOF CONSTRUCTION

Filed Aug. 21, 1936

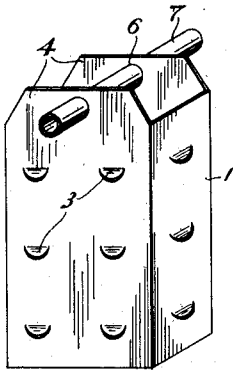


FIG. 1.

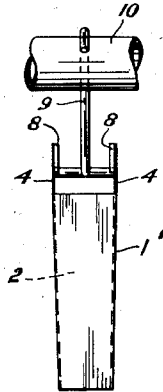


FIG. 2.

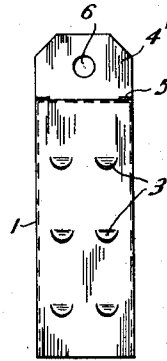


FIG. 3.

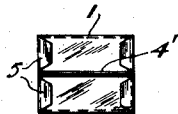


FIG. 4.

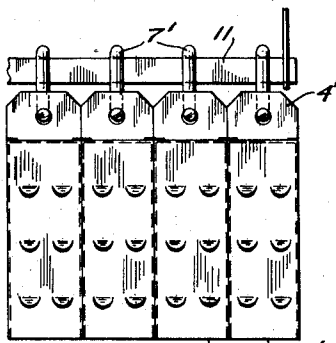


FIG. 5.

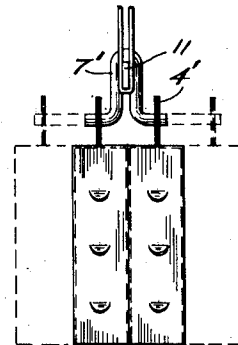


FIG. 6.

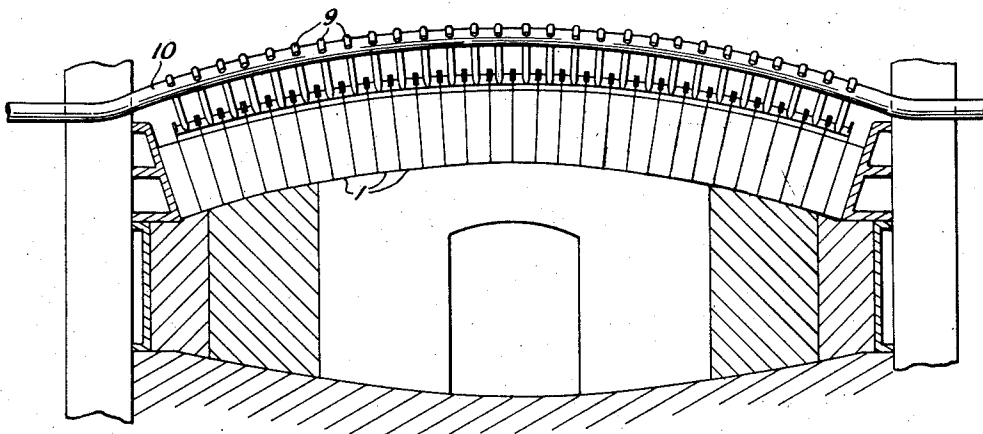


FIG. 7.

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2,187,669

FURNACE ROOF CONSTRUCTION

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Application August 21, 1936, Serial No. 97,187
In Canada August 12, 1936

7 Claims. (Cl. 110—99)

This invention relates to furnace roof construction and is particularly directed to the construction and suspension of basic or neutral brick units for such roofs.

In the production, refinement and other treatment of various metals the construction and maintenance of the roof of the furnace employed constitutes a substantial element in the cost of such operations. Many proposals have been made for reducing such cost and increasing the efficiency of operation of roofs of this character. For example, sockets have been formed in, or lugs on, the brick for receiving the suspending means and the adjoining faces of brick have been corrugated to receive and hold a suspending metal plate. Brick for furnace wall construction have been encased in metal shields which completely or partially surround the sides of the brick. Brick for use in furnace arched roofs have been given various interlocking shapes.

The object of the present invention is to provide an economical construction, which may be readily assembled as a whole initially or in part on repair, in which practically the full length of each brick unit is available for wear in use and in which each brick unit has integral suspending means external of its refractory portion whereby it may be supported in the roof assembly.

The invention is illustrated in the accompanying drawing, in which

Figure 1 is a perspective view of the brick unit with one form of support.

Figure 2 is a side view of a somewhat modified form of the unit and support.

Figure 3 is a side view of another form of the brick unit.

Figure 4 is a plan view of the latter form.

Figure 5 is an elevation view of a group of assembled units with supporting means.

Figure 6 is an end view of the construction shown in Figure 5.

Figure 7 is an end view partly in section of a furnace construction.

In the drawing, 1 is a casing, preferably of steel, into which is placed basic or neutral refractory material to form a compact refractory unit, constituting an unburned or chemically bonded brick, which may be at least temporarily supported therein by means of intumed projections 3. Two sides of the casing are upwardly extended to constitute integral lugs 4 as shown in Figures 1 and 2 or, as shown in Figures 3 and 4, two side walls may be bent over the top of the refractory portion to constitute an integral lug 4'. Portions of adjacent sides may be intumed

as at 5 for additional support. The casing 1 and the lugs 4' may be spot-welded or otherwise united as desired. The lugs 4 and 4' may be perforated as at 6 to receive auxiliary supporting members 7 or 7' or the lugs 4 may be provided with internal shoulders 8 to receive a supporting hook 9. The supports 7' and 9 are suspended on a bar 10 or other suitable means illustrated at 11 in Figures 5 and 6. If desired, the units 1' may be tapered as illustrated in Figure 2 for the formation of an arch such as shown in Figure 7, in which individual units are suspended on the beam or bar 10 supported at the sides of the furnace.

In manufacture, the casing with its integral lugs is preformed and welded and the refractory is compactly placed therein as by hammering to insure formation within the casing of an unburned brick portion which, supported by the projections 3 and the casing, will withstand handling and transportation incident to assembly in a furnace. When subjected to operating temperatures in the furnace the refractory portion is burned progressively upwardly throughout its length (say 18") and the casing walls become, as it were, welded to and about the refractory core, insuring at the exposed face of the roof a surface having great resistance to wear and spalling, yet retaining in each unit the suspending lugs so arranged that the full length of the refractory brick portion is available for operating use in the furnace. The life of the roof is thus substantially prolonged and there is little waste of expensive refractory material. As portions of the roof, subjected to most severe conditions, become unfit for further use, the units in such portions may be removed, without tearing down the whole roof, and be replaced by new units with their integral lugs.

The unburned brick portion may be preformed, as by pressing, to simply fit within the casing in which it may be supported by the taper and/or by the inward projections 3. The preformed unburned brick may be provided with depressions to receive the projections 3. The supports, as 10 and 11, may be pipes through which water may pass for cooling purposes. This makes it possible to use shorter and less expensive supporting hooks or members such as 7' or 9.

I claim:

1. In a furnace, a suspended roof construction comprising metallic suspending means, a sheath, and a shaped refractory unit therein, said sheath being open at its ends and formed of metal which at furnace operating temperature becomes ad-

herent to the refractory unit and having a side which is longer than the brick and which is formed for attachment to said suspending means.

2. A structure as defined in claim 1 wherein
5 said sheath has means for securing said refractory unit therein.

3. A structure as defined in claim 1 wherein
at least two opposed sides of said sheath have
means removed from their lower ends for secur-
10 ing said refractory unit therein.

4. A structure as defined in claim 1 wherein
said sheath is tapered at its lower end to pro-
vide means for retaining said refractory unit
therein.

5. In a furnace, a suspended roof construction
15 comprising metal suspending means, a sheath
and a refractory brick in the sheath, said sheath
being formed from metal adapted at operating
furnace temperature to fuse to said brick and
20 having two sides extended beyond the point
reached by the top of the brick, said sides having
their upper extremities adapted for connection
to said suspending means, and having means

removed from the lower end of the sheath for
securing the brick in the sheath.

6. In a furnace, a suspended roof comprising
a demountable hanger structure, a sheath formed
from steel and refractory material compactly dis-
posed within the sheath, said sheath having at
least one side which is longer than the body of
said refractory material and which is disposed
for attachment to said hanger structure and said
sheath having means independent of its lower
end for securing said refractory body therein.

7. In a furnace, a suspended roof construction,
comprising a demountable hanger structure, a
preformed metal casing, open at its ends, and
having integral therewith lug means projecting
from one end thereof and formed for attachment
15 to said hanger structure, and in said casing a
compactly formed unburned brick of neutral or
basic refractory material, said metal casing being
adapted under operating furnace conditions to
become fused to said brick.

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