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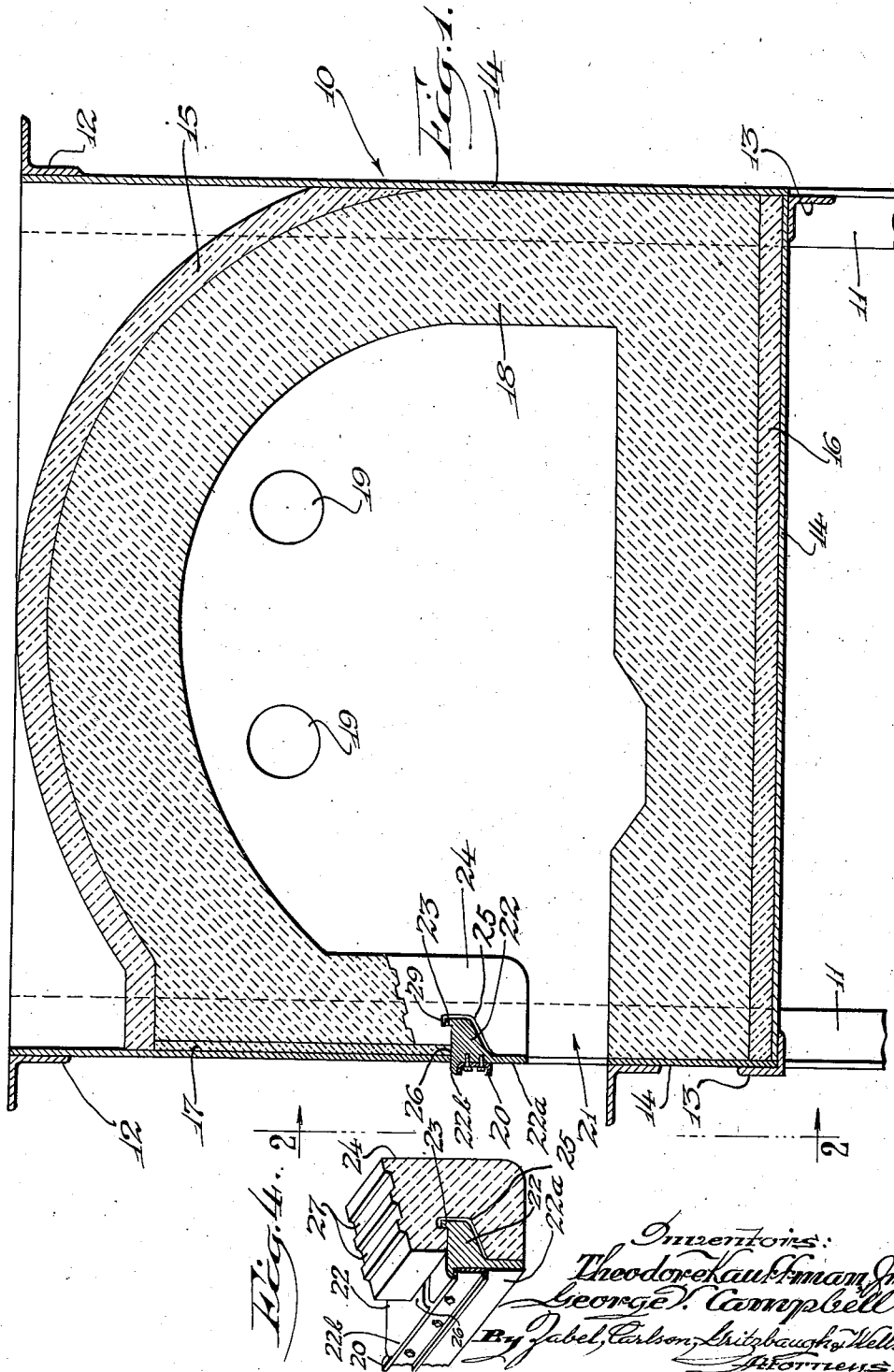
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2,358,718

ENTRANCE FOR SLOT TYPE FORGE HEATING FURNACES

Filed May 25, 1942

2 Sheets-Sheet 1



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Fig. 2.

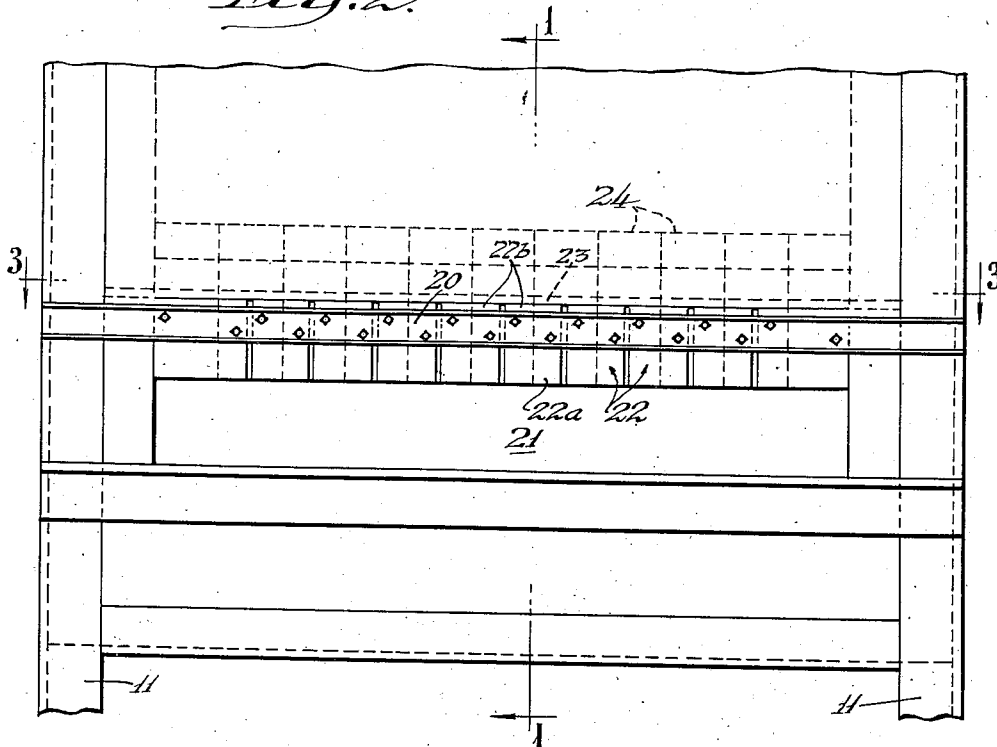
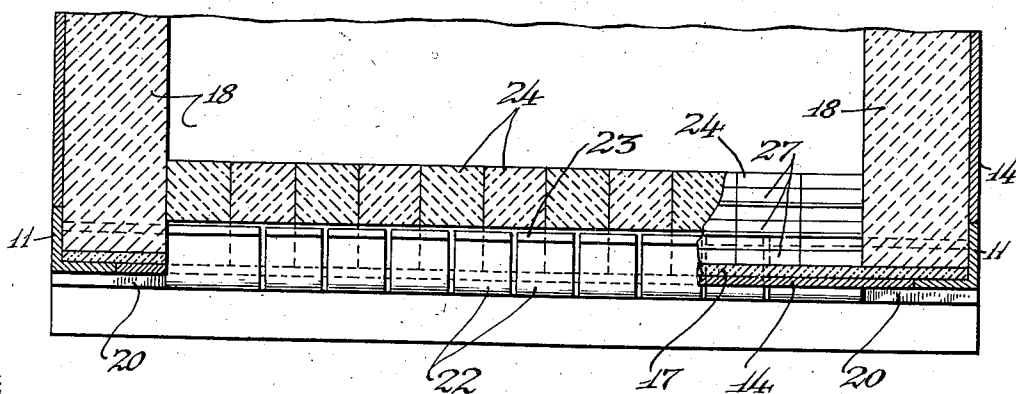


Fig. 3.



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ENTRANCE FOR SLOT TYPE FORGE
HEATING FURNACES

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Application May 25, 1942, Serial No. 444,481

4 Claims. (Cl. 263—46)

This invention relates to an improved entrance for a slot type forge heating furnace and in particular to an improved refractory wall construction for use in providing the slotted entrance of furnaces of this type.

The principal purpose of the invention is to provide means whereby a rectangular slot type of opening may be provided in the furnace wall without recourse to a radial arch. Such radial arches above referred to are of the type shown in the Hosbein Patent No. 1,628,284. Such arches are common in boiler furnaces but impractical for this type of furnace. A spring arch is unnecessarily wide at the center. Brick could be clamped in place but that causes spalling and is difficult.

The preferred embodiment of the invention herein described is shown in connection with a furnace provided with a monolithic refractory lining, although it is obvious that this invention may be used in connection with furnaces having other types of linings.

The advantages of a monolithic refractory lining are well understood in the art. Such a lining is obtained by laying a wall of plastic refractory material against the structural wall of the furnace and vitrifying the refractory wall in situ. Means are provided to anchor the refractory to the structural wall and such means are often in the form of refractory blocks. These blocks, however, are not of sufficient structural strength to support a hanging wall and a steel structural member is often necessary.

Whereas in the entrance of a slot type forge heating furnace a steel member could be used, the presence of hot gases in and about the entrance makes it necessary to protect the slot itself with a refractory.

It is a principal object of this invention to provide an entrance for a slot type forge heating furnace which is lined with refractory and which is capable of supporting the hanging wall above the entrance.

It is also an object of this invention to provide supporting anchor blocks for such a hanging wall which can be mounted upon a structural member and which will protect the structural member from heat.

In this connection it is also important to arrange the anchor blocks with respect to the structural member so as to permit a limited amount of expansion and contraction without affecting the wall which is supported thereby.

In the drawings in which like numerals refer to like parts, Fig. 1 is a sectional view of a furnace embodying a preferred embodiment of this

invention, the section being taken along line 1—1 of Fig. 2;

Fig. 2 is an elevation of the furnace shown in Fig. 1, the elevation being taken along line 2—2 of Fig. 1;

Fig. 3 is a section taken along line 3—3 of Fig. 2; and

Fig. 4 is a perspective view of one of the anchor blocks shown in the above figures.

Reference numeral 10 designates a furnace, one opening of which is in the form of a rectangular slot. The supporting structure consists of vertical supporting members 11 of angle iron together with horizontal top supporting members 12 and horizontal bottom supporting members 13 secured thereto. The structural walls of the furnace are formed of steel plates 14 which are secured to the several supporting members. The furnace is provided with a monolithic refractory lining 15. A lining of heat insulating material 16 covers the top of the furnace, this insulation being applied directly over the refractory. Similar heat insulating lining 16 is interposed at the bottom of the furnace between the refractory lining 18 and the steel plate 14 which forms the structural bottom wall of the furnace. A similar layer of heat insulating material 17 is provided at the front wall of the furnace.

The side walls are provided with ports 19 by means of which fuel and air may be supplied to the interior of the furnace.

The entrance to the furnace is in the form of a slot 21. A steel channel 20 extends across the front of the furnace and forms a part of the structural wall of the furnace immediately above the slot 21. A series of castings 22 are fastened to the channel 20 and extend inwardly from the channel 20. These castings have downwardly extending ledges 22a. It will be noted also that at the inner edge of each casting a lug 23 projects upwardly. The castings 22 are spaced apart somewhat. They have lips 22b overlying the channel 20. A plurality of refractory blocks 24 are provided with slots 25 and are fitted onto the castings 22 in side by side relationship. These blocks form the top wall of the slot 21. The slots 25 of the blocks are of similar configuration to the castings 22; that is, they are provided with channels 29 to accommodate the upwardly extending lugs 23 of the castings 22. The castings and blocks are offset so that the blocks cover the spaces between castings.

The side surfaces of the block 24 which are immediately above the slots 25 are offset as at 26 to accommodate the layer of heat insulating ma-

terial 17. The upper surface of each block is provided with a number of grooves 27 as shown in Fig. 4 so as to interlock with the monolithic refractory lining 18. It will be noted that this upper surface is not parallel with the bottom surface of the block, but rather it forms an acute angle to the structural wall of the furnace. This angle tends to keep the plastic in place.

The slot 25 in each block is of such size that after the block has been mounted upon the casting there is a space between the inner and lower edges of the casting and the block. This permits of a limited amount of expansion and contraction of the casting with respect to the block without disturbing the position of the block itself. In other words, the block rests solely on the top surface of the casting and the upwardly projecting lug 23 of the casting interlocks with the block to hold it in place. The swing or rotational tendency of the block is taken up by the depending ledges 22a on the castings. The lower outer faces of the blocks press against the ledges 22a.

The construction herein disclosed affords proper support for the wall above the entrance of a slot type furnace, and it permits the use of an originally plastic monolithic refractory material for said wall. The refractory blocks herein disclosed not only serve to anchor and support the originally plastic refractory material but they form a flat top wall for the opening 21 and completely protect the steel supporting channel 20 from the heat of the furnace.

It is obvious that various modifications and changes in the construction herein disclosed may be made without departing from the spirit of our invention. The above description and drawings are intended to illustrate only a preferred embodiment of our invention; the invention is to be limited only by the appended claims.

We claim:

1. A refractory block for supporting a plastic wall over the entrance slot in a forge heating furnace and forming the top wall of said slot, said block being provided with a slot at one side surface thereof whereby said block may fit over a supporting casting to protect the inner face and top of said casting, the upper surface of said block being disposed at an acute angle to the furnace wall and being provided with a plurality of projections constructed to interlock with an originally plastic refractory material in place above said block and supported thereby.

2. A furnace wall structure embodying a retaining wall, a narrow rectangular opening

therein, an originally plastic monolithic refractory lining therefor and means providing a straight horizontal top wall for said opening and supporting and retaining said lining over the opening comprising a supporting member running longitudinally of said wall above said slotted portion, blocks carried on said supporting member and extending downwardly and backwardly against the same and providing a downwardly facing wall extending inwardly from the slot opening, the blocks having top surfaces sloped downwardly toward the retaining wall and said lining being packed tightly against said top surfaces, said blocks being made of a refractory material so as to protect said supporting member from the heat of the furnace.

3. A furnace structure comprising a structural steel wall disposed above a slotted entrance, an originally plastic monolithic lining for said furnace and means to anchor and support said lining at a point above said slot, said means comprising a beam spaced above the lower edge of said steel wall and secured thereto, supporting castings thereon, a refractory shelf for supporting said lining, said shelf consisting of refractory blocks resting on said castings and being extended downwardly and along the inner side of said castings to form a refractory lining for the entrance to said furnace, said blocks having downwardly facing surfaces extending inwardly from the lower edges of the castings to provide a refractory top wall for the entrance slot, said blocks being provided with ribs interlocking with said lining to anchor said lining in place against said wall.

4. An entrance for a slot type forge heating furnace having a structural steel wall, said entrance comprising a layer of refractory material forming the lower wall of said entrance, said layer of refractory material being extended throughout the interior of said furnace, and a plurality of refractory blocks forming the upper interior wall of said entrance, said blocks being mounted with respect to the structural steel wall for said furnace, and being provided with upper surfaces extending obliquely in an upward direction away from said wall so as to permit said refractory lining to be wedged between the upper surfaces of said blocks and said structural wall, said blocks being provided with ribs on their upper surfaces to interlock with said lining.

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