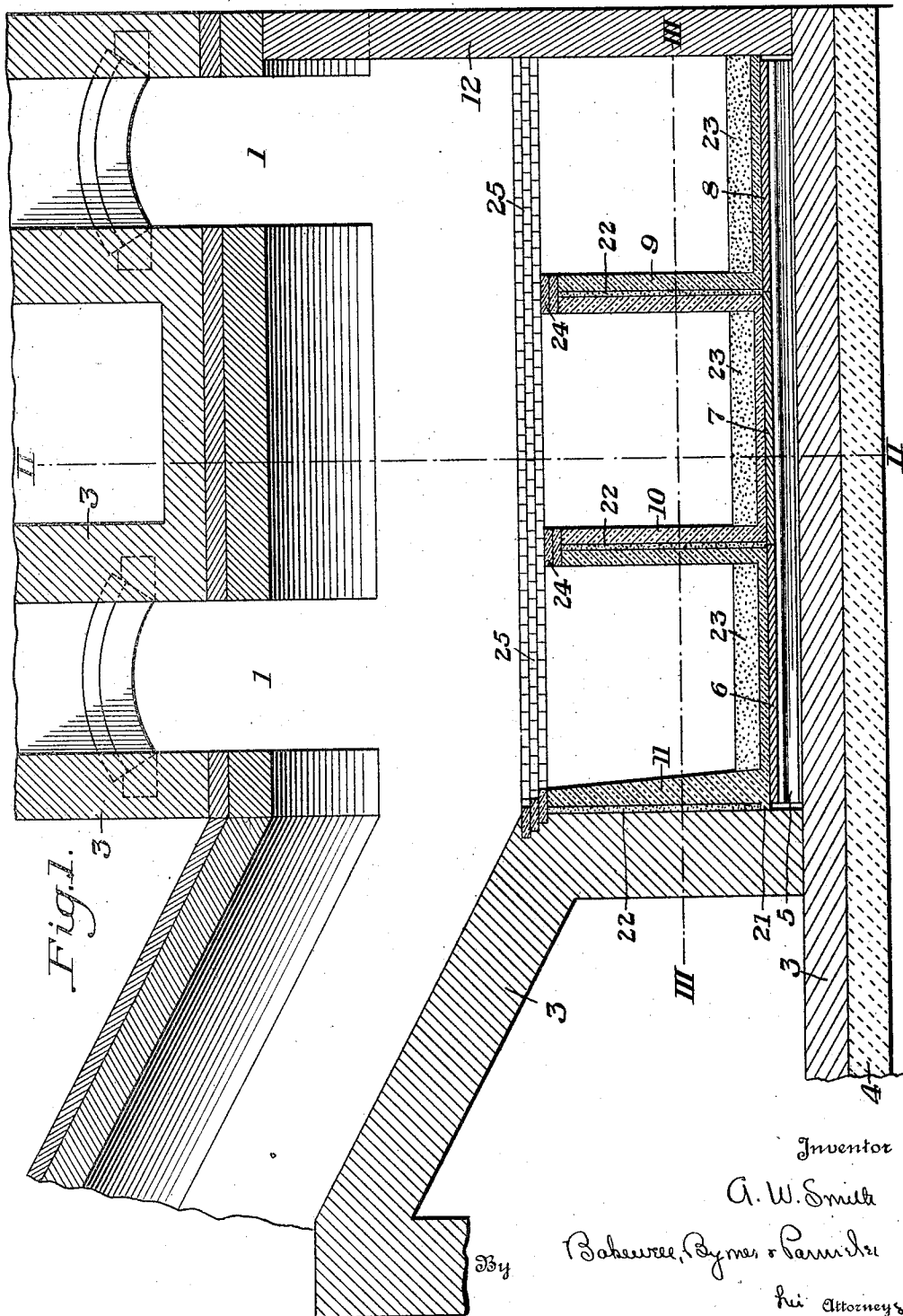
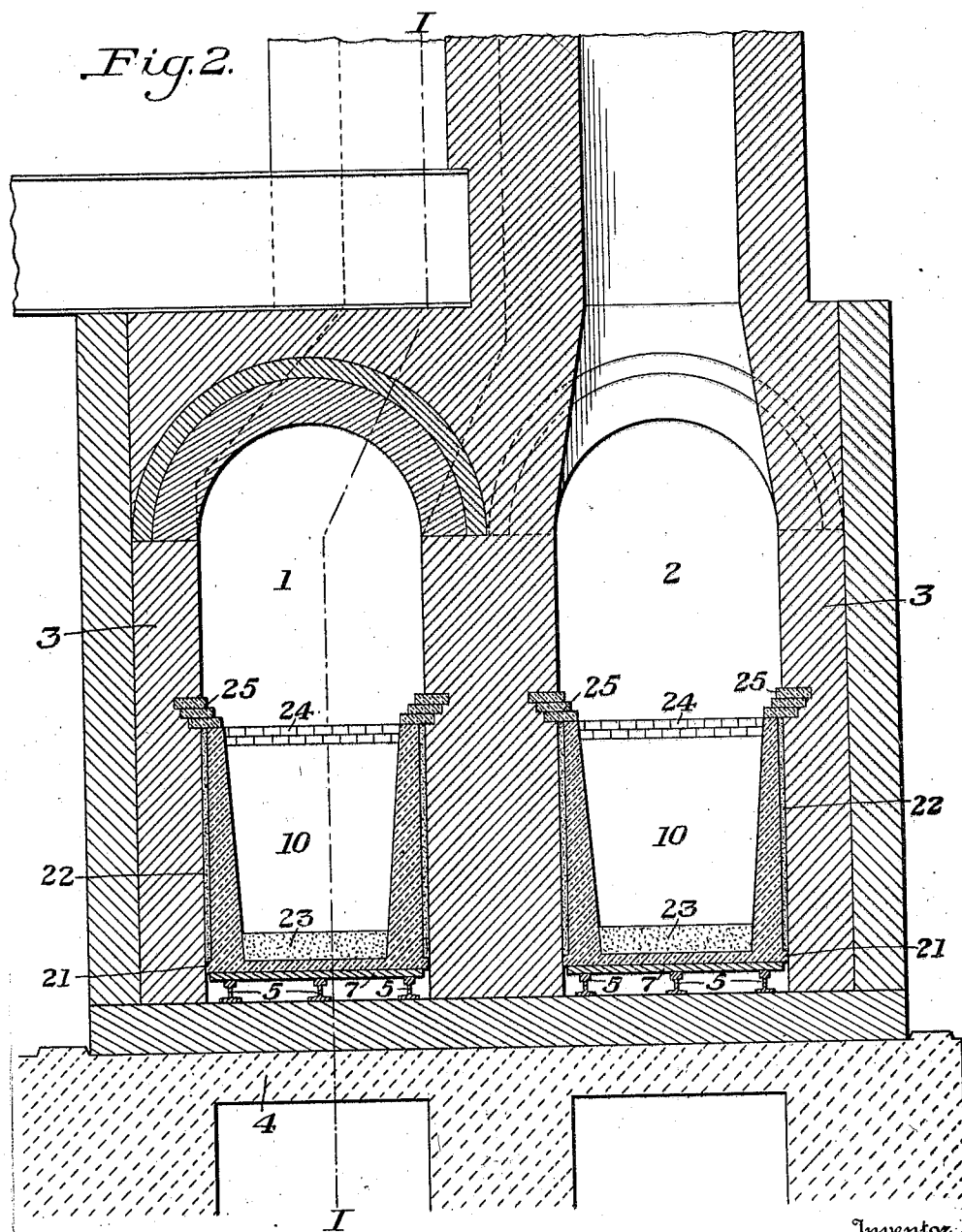


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Inventor

A. W. Smith

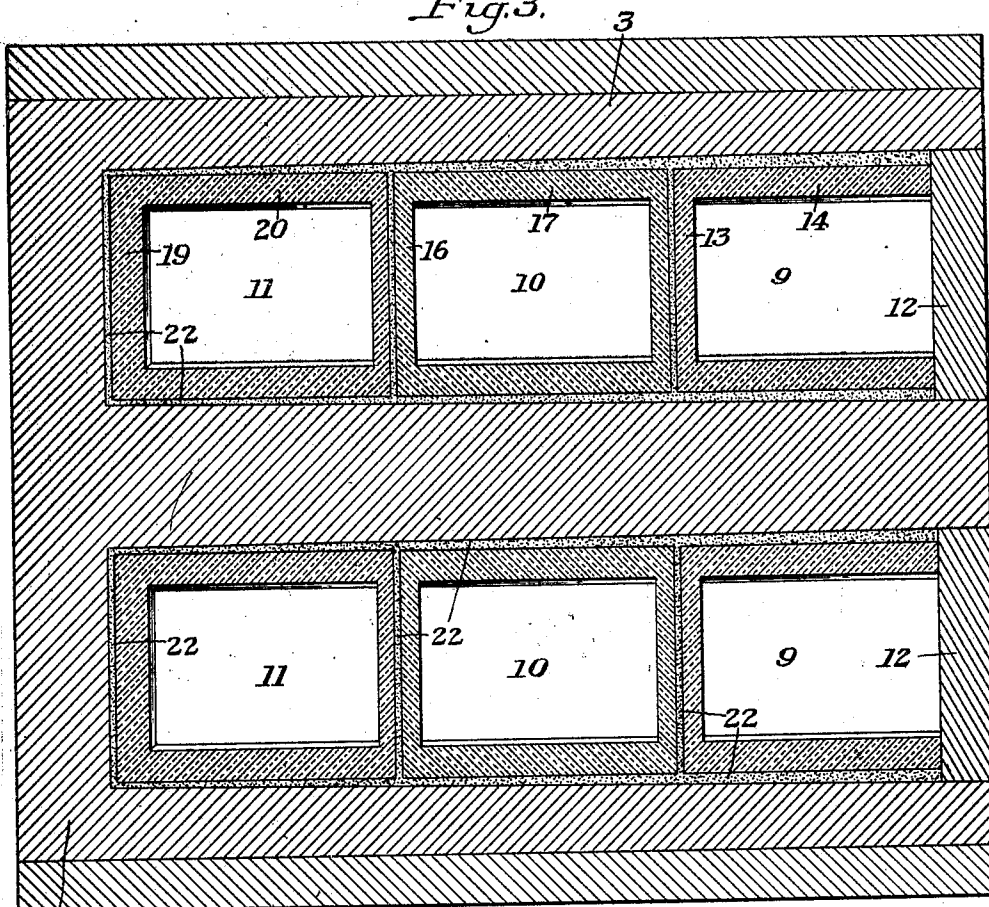
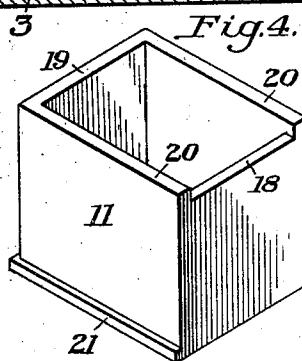
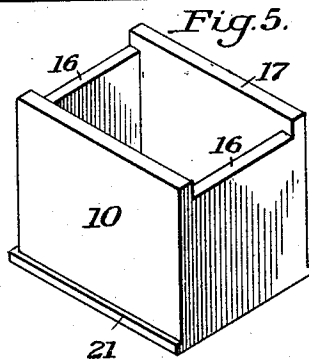
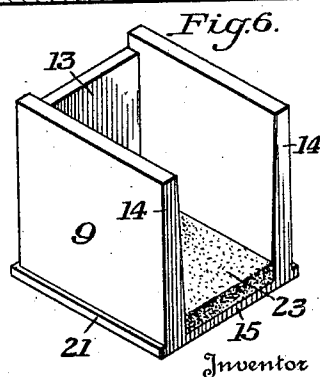
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A. W. SMITH.
SLAG POCKET.
APPLICATION FILED OCT 14, 1920.

Patented Sept. 5, 1922.
3 SHEETS—SHEET 3.

Fig. 3.



Inventor

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UNITED STATES PATENT OFFICE.

ALBERT W. SMITH, OF YOUNGSTOWN, OHIO.

SLAG POCKET.

Application filed October 14, 1920. Serial No. 416,734.

To all whom it may concern:

Be it known that I, ALBERT W. SMITH, a citizen of the United States, residing at Youngstown, county of Mahoning, and State of Ohio, have invented a new and useful Improvement in Slag Pockets, of which the following is a full, clear, and exact description.

My invention relates to slag pockets used in open hearth or other furnaces.

In the usual operation of an open hearth furnace for the manufacture of steel, the removal of slag from the slag pockets necessitates a periodical stopping and cooling of the furnace so that the slag may be removed. This is not only destructive to the customary brick work of the pockets but is very expensive and also reduces the production by stopping the operation of the furnace.

Heretofore attempts have been made to remedy the difficulties referred to, but without success.

I have devised the arrangement shown in the drawings and hereinafter described to overcome the difficulties above set forth and find that by the use of my invention much time and expense are saved in the operation of the furnace to which my invention is applied.

My invention will be better understood by reference to the accompanying drawings forming a part hereof and in which:

Figure 1 is a sectional elevation of a portion of a furnace having a slag pocket embodying my invention.

Figure 2 is a sectional view taken on line II—II of Figure 1;

Figure 3 is a section of the slag pocket on line III—III of Figure 1; and

Figures 4, 5 and 6 are detailed perspective views of the slag receptacles.

My invention may be applied to any open hearth furnace and therefore a detail description of the parts of the furnace shown in the drawings other than the slag pocket need not be entered into. The furnace has the usual air ducts 1, as shown in Figure 1, and the gas duct 2, as shown in Figure 2, and also the ordinary walls 3 of any suitable material or construction desired.

The furnace is set upon the usual foundation 4. Placed upon the bottom wall 3 are steel rails 5. Placed upon the rails 5 are suitable slabs 6, 7 and 8. Upon the slab 8 is placed a receptacle 9, upon the slab 7 a

receptacle 10 and upon the slab 6 a receptacle 11. At one end of the furnace is provided a bulk head 12 which may be removed without injury to the furnace. This bulk head constitutes one end of the receptacle 9, the said receptacle having an opposite end 13 and two sides 14 and a bottom 15, as shown in Figure 6. The receptacles 10 and 11 are substantially like receptacle 9, except that receptacle 10 has two similar ends 16 and two sides 17 similar to the sides 14 of the receptacle 9. It will be noted that the end 13 of receptacle 9, and the ends 16 of receptacle 10, are lower than the respective sides of the two receptacles. The receptacle 11 has one end 18 of the same height as the ends 13 and 16 of the other receptacles and the other end 19 of the receptacle 11 is the same height as the sides 20, which in turn are the same in height as the sides of the receptacles 9 and 10. Each of these receptacles is provided along its sides and one end with a flange 21. The purpose of this flange will appear later.

The receptacles 9, 10 and 11 are placed on the respective slabs as above described, and between the adjacent ends of the receptacles is placed a thin layer of non-fusible material 22 such as chrome ore, coke or gas producer flue dust. Chrome ore is preferred. This layer of non-fusible material is the same width as the flange 21 and in fact fills the space between the adjacent receptacles and between the sides of the receptacles and the wall 3. There is a layer of this non-fusible material between each side of each of the receptacles and the permanent structure of the furnace. The only point not provided with this non-fusible material is the end of the receptacle 9, which is constituted by the temporary bulk head 12. Placed in the bottom of each of the receptacles is a layer of any suitable material 23, such as silica sand. The adjacent walls between the receptacles are capped with silica bricks 24. The tops of the side walls are also capped with silica bricks 25 to keep the slag from penetrating the space filled with the non-fusible material. The permanent walls of the slag pocket are built so that the pocket tapers, that is to say the pocket is wider at the end nearest the bulk head 12 than it is at the other end, so that when the slag is being removed the receptacle 9 may be first taken out after demolishing the bulk

head and the other receptacles 10 and 11 may be easily withdrawn because the pocket gradually increases in width toward the end where the bulk head is placed. By providing a layer of non-fusible material between the adjacent receptacles and also between each receptacle and the permanent walls of the furnace and capping the side walls and adjacent ends, the receptacles containing the slag may be easily removed from the pocket as separate units, and by this construction the slag which falls into the adjacent receptacles is prevented from fusing together and forming a solid mass of large dimensions which would be very difficult to remove without injuring the permanent structure of the furnace.

In operation the temporary silica bulk head 12 is removed and crane hooks or other means are attached to the slag in the compartment 9. A pull to the right, in the structure, as shown in Figure 3, will shear the capping bricks and the division wall around the compartment 9, allowing the receptacle 9 containing slag to be removed as a unit, taking with it the temporary side wall, division wall and the bottom lining of brick and sand. By a similar operation the other compartments 10 and 11 may be removed and when this has been done new receptacles may be placed in position and built up as heretofore described.

From the foregoing it will be evident that many advantages result from the construction described and that the efficiency of the furnace is increased because of the facility with which the slag may be removed therefrom.

I claim:

1. A slag pocket for open hearth and other furnaces, comprising a plurality of receptacles, a compartment receiving said receptacles, said compartment gradually increas-

ing in width towards the exit end thereof, substantially as described.

2. A slag pocket for open hearth and other furnaces, comprising a plurality of receptacles, a compartment receiving said receptacles, a permanent wall at one end of said compartment, a bulk head at the other end thereof, said compartment gradually decreasing in width from said bulk head to said permanent wall, substantially as described.

3. A slag pocket for open hearth and other furnaces, comprising a compartment, rails in said compartment, a plurality of slabs on said rails, a receptacle on each slab, a layer of non-fusible material between each pair of adjacent receptacles, said compartment gradually increasing in width toward the exit end thereof, substantially as described.

4. A slag pocket for open hearth and other furnaces comprising a plurality of integral slag receptacles operating independently of each other, a compartment holding said receptacles and increasing in width toward the exit end thereof to allow the ready removal of said receptacles when containing slag, substantially as described.

5. A slag pocket for open hearth and other furnaces, comprising a plurality of integral receptacles, each having a flange extending around three sides near the bottom thereof and acting to separate said receptacles from each other and the permanent walls of the furnace, non-fusible material filling the space between the receptacles and that between each receptacle and the permanent walls of the furnace, and means for protecting said non-fusible material from direct contact with the slag, substantially as described.

In testimony whereof, I have hereunto set my hand.

ALBERT W. SMITH.