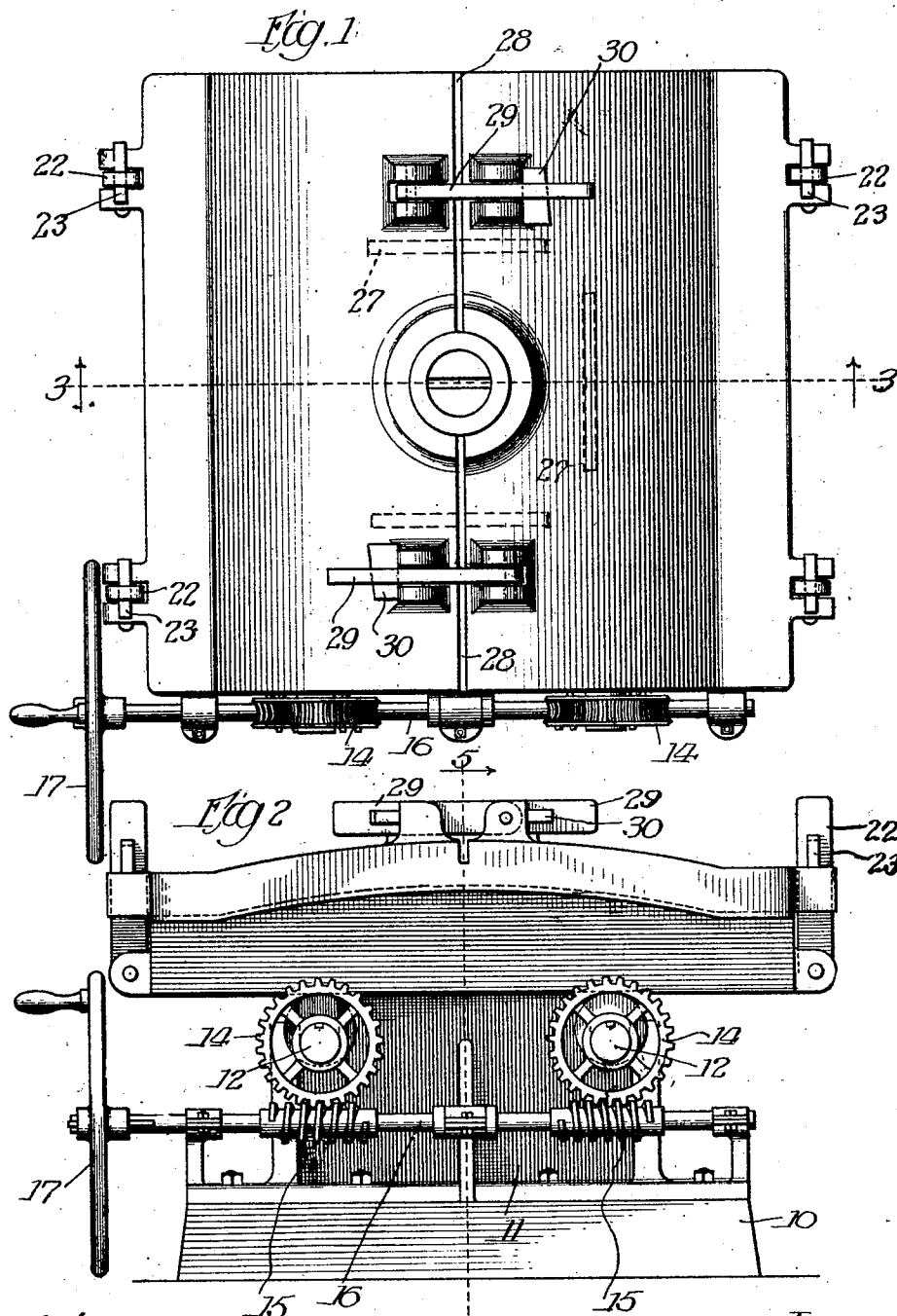


J. B. WALKER.
 APPARATUS FOR CASTING FURNACE DOORS.
 APPLICATION FILED AUG. 7, 1911.

1,018,090.

Patented Feb. 20, 1912.

3 SHEETS—SHEET 1.



Witnesses:
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Chas F Murray

Inventor:
John B Walker
 by *Luthium Bell Miller*
Attys

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Fig. 3

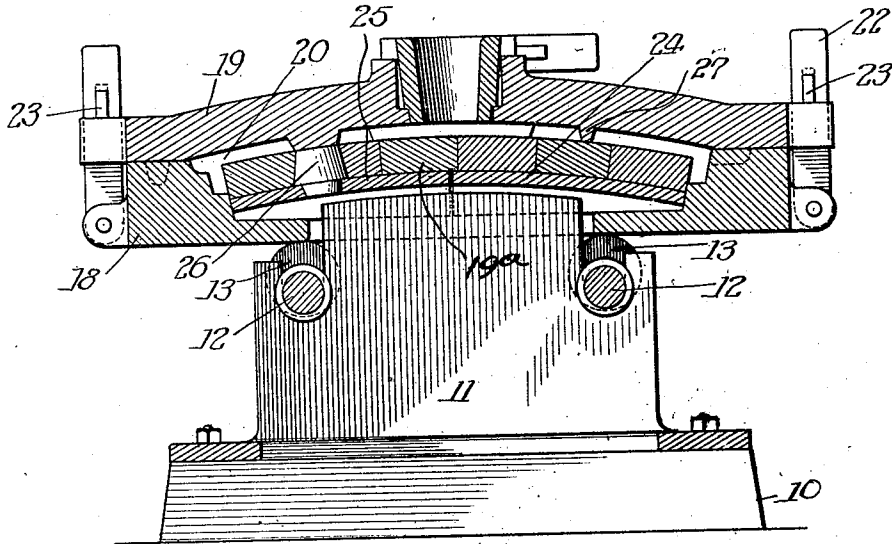
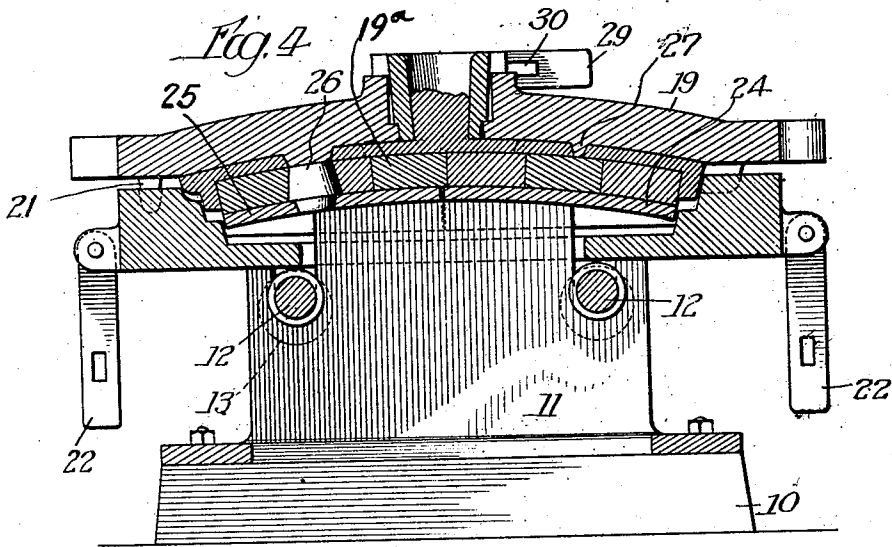


Fig. 4



Witnesses:
 Arnold E. Bennett
 Charles J. Manning

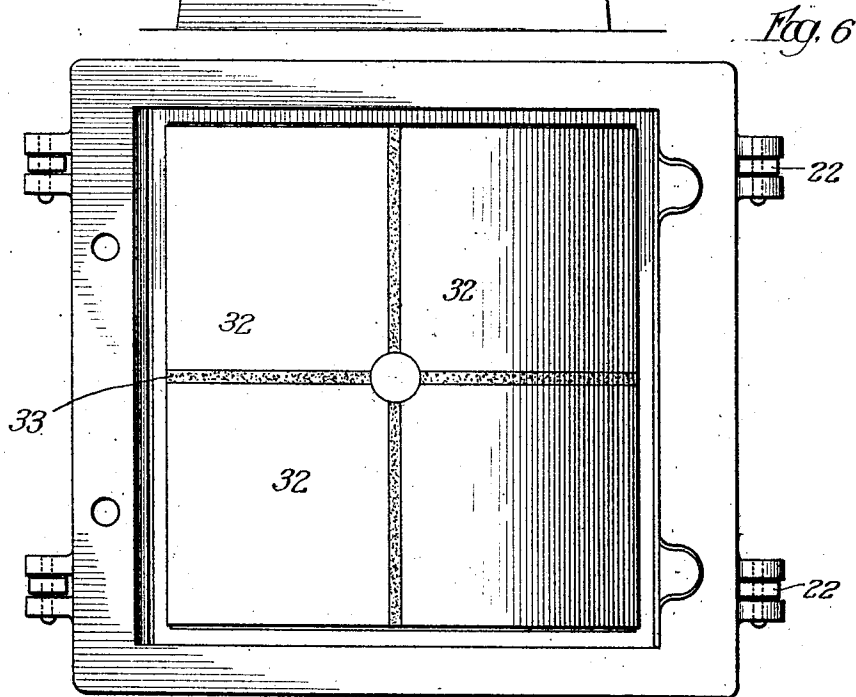
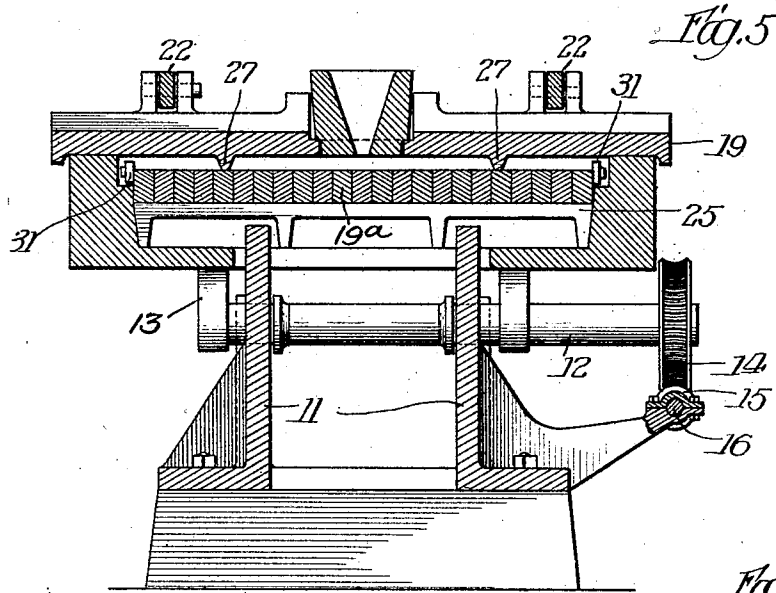
Inventor:
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UNITED STATES PATENT OFFICE.

JOHN B. WALKER, OF ENSLEY, ALABAMA.

APPARATUS FOR CASTING FURNACE-DOORS.

1,018,090.

Specification of Letters Patent.

Patented Feb. 20, 1912.

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To all whom it may concern:

Be it known that I, JOHN B. WALKER, a citizen of the United States, residing at Ensley, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Apparatus for Casting Furnace-Doors, of which the following is a specification.

My invention relates to a casting chill and has particular reference to a device of this character, adapted for use in casting furnace doors.

It will be understood that open hearth furnaces are provided with a plurality of doors, usually four, for the admission into the furnace of materials to be treated. These doors are usually mounted for vertical reciprocation and are subjected to a very high degree of heat. I have therefore devised a form of door together with apparatus for casting the same, with the object in view of providing a door which shall be less subject to the action of the heat and which may be economically produced.

A particular object of the invention is to provide apparatus by means of which bricks or other refractory material may be cast in and form a substantially integral part of a door of this character. It is contemplated that the bricks or other heat-resisting elements shall be arranged on the side next to the greatest heat. In this way the destructive action of the intense heat, due both to the disintegration of the metal and to cracking caused by expansion and contraction is minimized.

My invention will be more readily understood by reference to the accompanying drawings, wherein,

Figure 1 is a plan view of my novel apparatus; Fig. 2 is a side elevation thereof; Fig. 3 is a section on the line 3—3 of Fig. 1, showing bricks in place and the apparatus ready for the pouring of the metal there-around; Fig. 4 is a section on the same line as Fig. 3, a casting having been made and the bottom member of the chill allowed to descend away therefrom; Fig. 5 is a section on the line 5—5 of Fig. 2, and Fig. 6 is a modification wherein removable core members are employed in the place of bricks.

Referring more particularly to the drawings, it will be seen that I provide a base member 10, having a frame work mounted thereon, this frame work including two ver-

tical projections or supports 11. Mounted in bearings in the supports 11, are shafts 12, 12, having cams 13, 13 secured thereto. I provide means for rotating the shafts and cams, such means in the present instance being toothed members 14, 14, engaging with worms 15, 15, mounted on a common shaft 16 and operable by means of a hand wheel 17. It will be noted that the worms 15 are right and left hand, in order that the cams may move in opposite directions. It will be understood also that I may prefer to provide power means for rotating the cams.

Mounted above the supports is the chill, comprising bottom member 18 and top member 19. A casting space 20, is provided between the members, the two members being held in proper relation by means of dowels 21, and fastening means such as links and wedges 22, 23.

Mounted within the casting space and forming the bottom wall thereof, I provide a floor composed of two members 24, 25, the member 25 having an opening therethrough in which is seated a round plug 26, composed preferably of core material and adapted to provide for the testing or sight hole through the door. Integral with the top member 19 and projecting into the casting space 20, I provide ribs 27. These are provided in order to form grooves in the casting, these grooves permitting expansion and contraction without cracking. As will be seen by reference to Fig. 1, these grooves will be preferably laid out in the form of a square but are not continuous, metal being left between the ends of the adjacent grooves in order to provide a support for the metal in the center.

By reference to Fig. 1, it will be seen also that I provide a groove 28 in the top member 19, this groove being continuous from side to side of the member and extending part way through the thickness of the metal. This provides for expansion and contraction of the top member and in order to prevent the possible separation of the member due to breakage at this point, links 29 and wedges 30 are employed.

In operation the bottom member is lifted by means of the cam members 13, the top member 19 removed and a course of brick work 19^a laid on the floor members 24, 25. These are fitted nicely and held in place by means of chaplets 31. The chaplets are provided in order to prevent the possible

floating of the brick when the metal is poured therein. The top member 19 is then placed and securely fastened by means of the links and fastening wedges 22, 23, the parts all being as represented in Fig. 3. Molten metal is then poured through the pouring gate and fills the casting space and the interstices around the bricks. The casting being segmental in shape, it will be seen that after the metal is set, the bricks are securely held in place. Thereafter the cam shafts are rotated, thus allowing the bottom member 18 to descend. The floor members 24, 25, and the superposed casting and bricks are not permitted to descend with the bottom member but are held in elevated position by contact with the uprights 11. Thus it will be seen that after the removal of the fastening members 22, 23, and the shifting of the cams that the bottom member 18 will be removed from the casting and that with the removal of the top member, the furnace door is practically complete the only necessary additional work being the removal of the sprue.

In Fig. 6 I have shown a modification wherein bricks are not employed as lining for the door. In this case I provide cores 32, there being preferably four thereof, these core members when placed, filling a space corresponding to that which would be occupied by the bricks. It will be seen, however, that if a one-piece member were used, or if no clearance were provided between the edges, that the core member could not be removed. Therefore I provide spaces between the adjoining edges of the core members 32 and fill this space with sand, as shown at 33. By this means the cores may be made of metal and after the casting operation readily removed.

It will be understood that many modifications, such as those which may suggest themselves to those skilled in the art, are contemplated by me and are within the scope of my invention.

I claim:

1. Apparatus for casting furnace doors, comprising, in combination, a support, a chill on said support, said chill comprising top and bottom members having a casting space therebetween, means for removably uniting said top and bottom members, a floor mounted in and vertically movable with relation to said bottom member, and a cam member mounted on said support and arranged to permit the bottom member of said chill to move downward and away from a casting contained in said casting space, substantially as described.

2. Apparatus for casting furnace doors, comprising, in combination, a support, a chill on said support, said chill comprising top and bottom members having a casting space therebetween, means for remov-

ably uniting said top and bottom members, a floor mounted in and vertically movable with relation to said bottom member, and cam means mounted in said support and adapted to permit said bottom member to separate from a casting contained in said casting space, said shiftable floor being held against downward movement by contact with a portion of said support, substantially as described.

3. Apparatus for casting furnace doors, comprising, in combination, a support having an upwardly projecting portion, a chill superposed above said support, said chill comprising top and bottom members having a casting space therebetween, cam means mounted in said support and adapted to cause vertical reciprocation of a portion of said chill, a floor forming the lower wall of said casting space and means for shifting said cam means whereby the bottom member of said chill is permitted to be lowered away from a casting contained in said casting space, said floor and superposed casting being held in elevated position by contact with the projections on said support, substantially as described.

4. Apparatus for casting furnace doors, comprising, in combination, a support, a chill on said support, said chill comprising top and bottom members having a casting space therebetween and said top member being provided with an expansion groove, means for removably uniting said top and bottom members, a floor mounted in and vertically movable with relation to said bottom member, said floor forming the bottom wall of said casting space and cam members mounted on said support and arranged to permit the bottom member of said chill to be moved downward and away from the casting contained in said casting space, substantially as described.

5. Apparatus for casting furnace doors, comprising, in combination, a support, a chill on said support, said chill comprising top and bottom members having a casting space therebetween and said top member being provided with ribs projecting into said casting space, means for removably uniting said top and bottom members, a floor mounted in and vertically movable with relation to said bottom member, said floor forming the bottom wall of said casting space and cam members mounted on said support and arranged to permit the bottom member of said chill to be moved downward and away from the casting contained in said casting space, substantially as described.

6. Apparatus for casting furnace doors, comprising, in combination, a support, a chill on said support, said chill comprising top and bottom members having a casting space therebetween, means for removably

uniting said top and bottom members, a floor mounted in and vertically movable with relation to said bottom member, chill members mounted on said floor and provided with sand spaces between their adjacent edges and cam means mounted in said support and arranged to permit the bottom

member of said chill to move downward and away from the casting contained in said casting space, substantially as described.

JOHN B. WALKER.

Witnesses:

C. F. BRYANT,
P. V. KOLB.