

May 19, 1936.

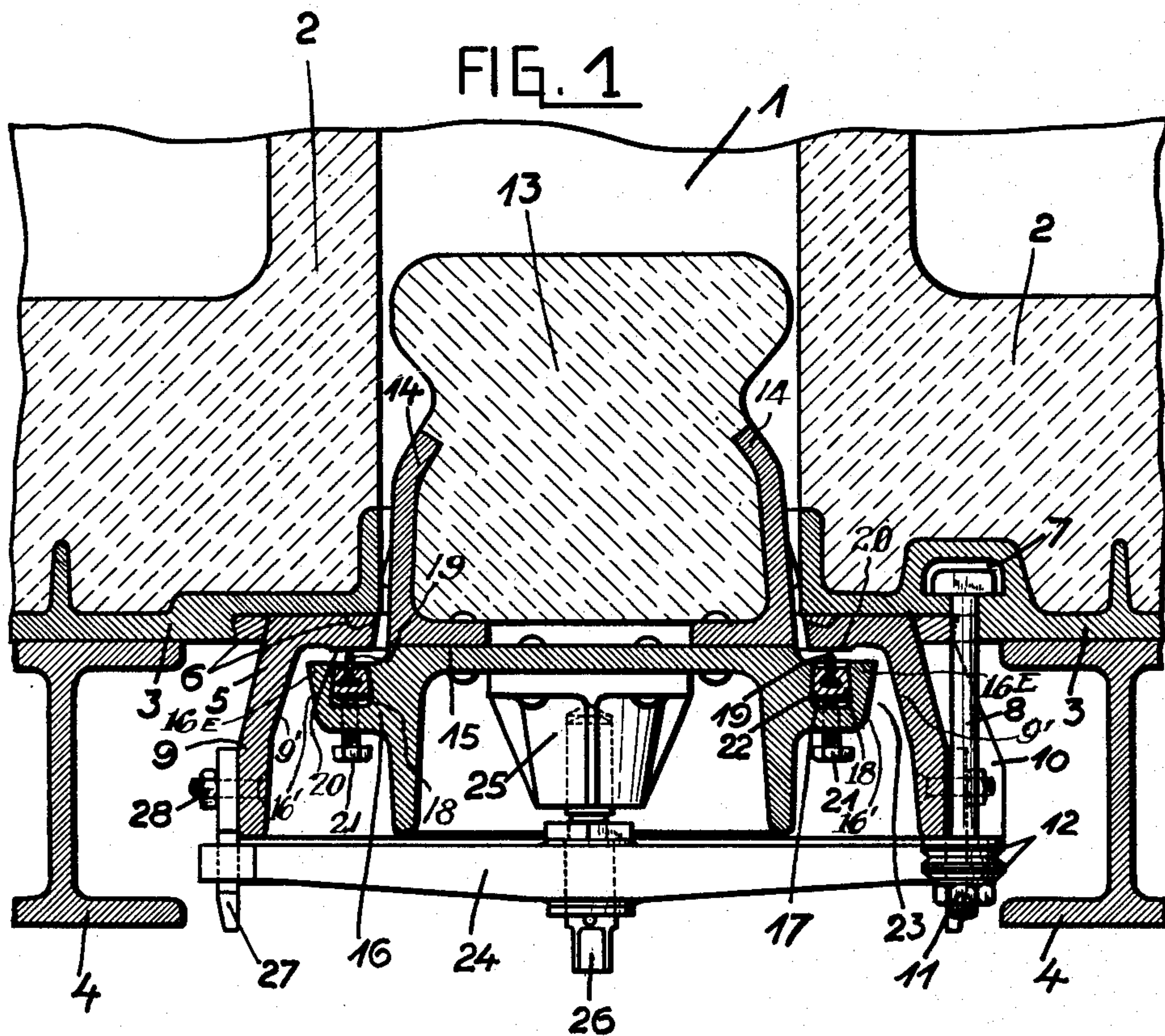
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2,040,887

COKE OVEN DOOR

Filed May 3, 1932

2 Sheets-Sheet 1



Inventor:

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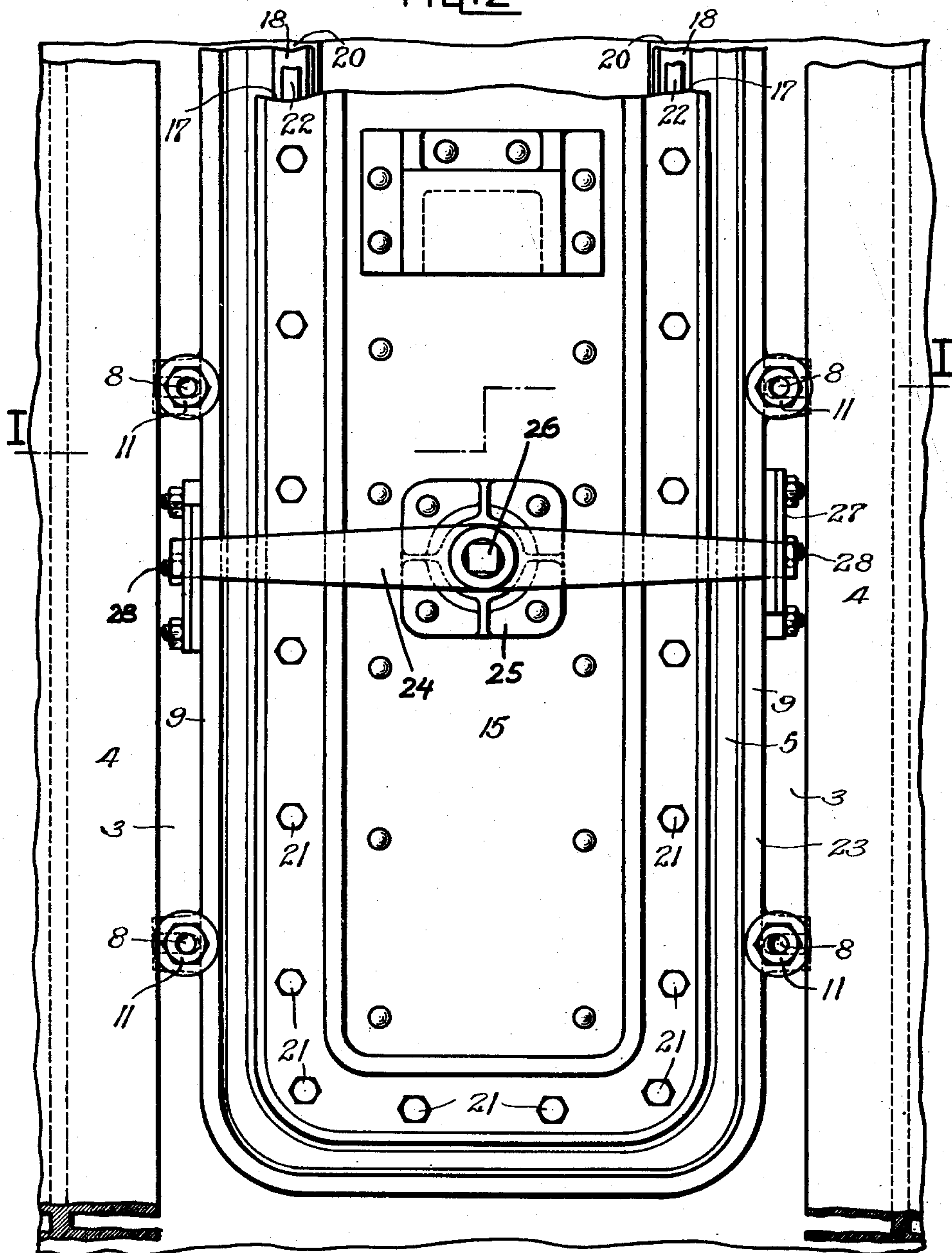
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FIG. 2



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UNITED STATES PATENT OFFICE

2,040,887

COKE OVEN DOOR

Paul Van Ackeren, Essen, Germany, assignor, by
mesne assignments, to The Koppers Company
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Delaware

Application May 3, 1932, Serial No. 608,873
In Germany May 4, 1931

2 Claims. (Cl. 202—248)

This invention relates to coke oven doors, that is to the door-like arrangements employed for closing during the coking process the apertures through which the coke is removed from the chambers of coke ovens, and has more particular reference to coke oven doors of the type in which the crack or fissure between door and door frame is selectively either closed with clay or the like or covered by a metal frame resting on flat sealing surfaces or in flat grooves formed in the door or door frame.

In my pending patent application relating to coke oven doors filed December 5, 1930, Serial No. 500,221, I have described a coke oven door which can be used either with a so-called clay packing or a so-called metal-on-metal sealing. In the door described in this prior patent application, when the metal-on-metal sealing is employed, the door fissure is closed by a resilient sheet metal frame running substantially parallel to the plane of the door which is secured to the outer periphery of the door and has an edge projection or flange facing towards the door frame which when the door is closed applies itself resiliently against a suitable sealing or packing surface formed on the door frame. If my prior coke oven door is used with clay packing the metal sealing frame described is removed from the door so that the packing clay can be pressed into the space between the faces of the door or door frame which widen outwards in the form of a wedge. For this purpose the door frame is provided with an outwardly projecting peripheral bar which when the door is set in position in the frame projects somewhat beyond the door element on all sides.

One object of my present invention is to provide an improved coke oven door adapted to be used selectively either with clay packing or with a metal-on-metal sealing without a metal sealing frame having to be removed from or secured to the door element when the manner of sealing the door is changed.

The essential feature of the coke oven door constructed in accordance with my present invention is the provision of a resilient metal sealing frame on the side of the door element facing the coking chamber, the said sealing frame being secured to the door element in such a manner that its projecting sealing surface can be adjusted relatively to the door element or bent in accordance with the existing course of the sealing surface of the door frame.

Reference will now be made to the accompanying drawings in which I have illustrated a coke

oven door constructed in accordance with my present invention and in which:—

Figure 1 is a section taken through the door along the line I—I of Figure 2, and

Figure 2 is an elevational view of the door, the upper part thereof being omitted for clearness of illustration, being the same as the lower part shown.

In the embodiment of my invention which is illustrated in the drawings the coke oven door serves to close the chamber 1 of a horizontal chamber oven consisting of refractory brickwork 2. The brickwork 2 of the oven is surrounded externally by a metal covering 3 having anchor stanchions 4 which serve to hold together the brickwork blocks of the oven.

On the metal covering 3 around the door aperture or doorway of the coking chamber 1 a metal frame 5 is secured, packing material 6 being provided between the frame 5 and the metal covering 3. The door frame 5 is secured by means of bolts 8 (only one of which is shown in detail in Fig. 1 and four in Fig. 2, since the others are duplicates thereof) whose heads engage in cavities 7 in the metal covering 3. The door frame 5 is provided externally with a peripheral bar-shaped extension 9 which is provided at the parts adjacent the bolts 8 with reinforcing ribs 10 on whose end surfaces the nuts 11 of the bolts 8 engage through the intermediary of plate springs 12. In this manner the door frame 5 is held resiliently against the metal covering of the oven brickwork so that when the metal covering 3 bends as it must do during the operation of the oven the door frame 5 remains unharmed.

The door itself consists of a stopper-shaped element 13 composed of refractory material which when the door is set in position projects into the oven chamber approximately as far as the heating zone. The stopper element 13 is secured by bars 14 to the metal door element 15 which has an edge projection or flange 16 engaging over the door frame 5 on all sides and providing on the edge 16 of the door an inner face 16E having a groove 17 of approximately U-shaped cross section. In the groove 17 self-sealing means are provided comprising a resilient packing material 18 in which a sealing frame 19 consisting of resilient T-iron or the like is embedded in such a manner that one edge of the T-iron projects out from the groove 17.

The projecting edge of the frame 19 is shaped in the form of a knife and when the door is shut

it applies itself against a suitable sealing surface 20 of the door frame 5.

In order to enable the sealing edge of the metal frame 19 to be adapted when necessary 5 to the sealing surface 20 of the door frame 5, set screws 21 are provided on the door element which act through the intermediary of a press frame 22 on the packing material provided in the groove 17 which consists preferably of asbestos or the 10 like. Preferably the section of the groove 17 is reduced somewhat outwardly so that the packing material 18 is pressed like a wedge by the screws 21 into the groove 17 thus forming a very effective packing.

15 When the door illustrated in the drawings is used with clay packing the clay paste is introduced into the space of the luting channel indicated at 23 between the peripheral bar-shaped extension 9 of the door frame 5 and the face of the door projection or peripheral luting member 16 on the door. As shown in Figure 1 the 20 peripheral luting member 16 on the door and the peripheral bar-shaped extension 9 cooperate to form a luting channel 23 for packing material, and the self-sealing means is within the confines of said channel 23. The packing space 23 is of approximately V-shaped section, the end face 16' of the door projection 16 and the inner face 9' of the bar 9 of the door frame 5 gradually be- 30 coming more remote from each other outwardly.

The door is secured in the door frame by means of the rotary bolt bar 24 mounted rotatably in a bearing 25 of the door. The bar 24 is provided with a square head 26 for the key. In the closed 35 position the bar 24 engages behind hook-shaped projections 27 which are secured to the door frame 5 by means of screws 28.

I wish it to be understood that I do not desire to be limited to the exact details of construction 40 illustrated and described herein, for obvious modifications will occur to a person skilled in the art.

In the claims hereinafter made no selection of any particular embodiment of my present invention is intended to the exclusion of other embodi- 45 ments thereof, and the right subsequently to make claim to any modification not covered by these claims is expressly reserved.

I claim:

50 1. A combination closure for coke ovens, comprising a door frame and a door body adapted to fit in said frame and comprising both an outer peripheral luting sealing means adapted for holding a manually applied clay packing seal and an inner peripheral self-sealing means for 55 automatic metal-on metal sealing surrounding

the door on all sides for sealing the space between the door body and the door frame, the self-sealing means being located on the inner face of an edge of the door overlapping the door frame but still within the confines of the luting 5 sealing means and having means for its adjustment from outside the door, and the luting sealing means comprising a peripheral edge surface of the door and a peripheral extension on the door frame forming a V-shaped channel opening 10 outwardly around the door and gradually becoming more remote from each other outwardly for self cleaning, and the luting sealing means being spaced a sufficient distance from the self-sealing means so that the adjusting means for 15 the self-sealing means and the V-shaped channel are both accessible without interfering with each other from outside the door in its closed position for adjustment at will of the self-sealing means or for manual packing of the luting chan- 20 nel and independently of the presence of each other while both sealing means are still in position on the door.

2. A combination closure for coke ovens, comprising a door frame and a door body adapted 25 to fit in said frame and comprising both an outer peripheral luting sealing means adapted for holding a manually applied clay packing seal and an inner peripheral self-sealing means for auto- 30 matic metal-on metal sealing surrounding the door on all sides for sealing the space between the door body and the door frame, the self-sealing means being located within a channel on the inner face of an edge of the door overlapping the 35 door frame but still within the confines of the luting sealing means and having means for its adjustment from outside the door, and the luting sealing means comprising a peripheral surface of the aforesaid edge of the door and a peripheral 40 extension on the door frame forming a V-shaped channel opening outwardly around the door and gradually becoming more remote from each other outwardly for self cleaning, and the luting sealing means being spaced a sufficient distance 45 from the self-sealing means so that the adjusting means for the self-sealing means and the V-shaped channel are both accessible without interfering with each other from outside the door in its closed position for adjustment at will of the 50 self-sealing means or for manual packing of the luting channel and independently of the presence of each other while both sealing means are still in position on the door.

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