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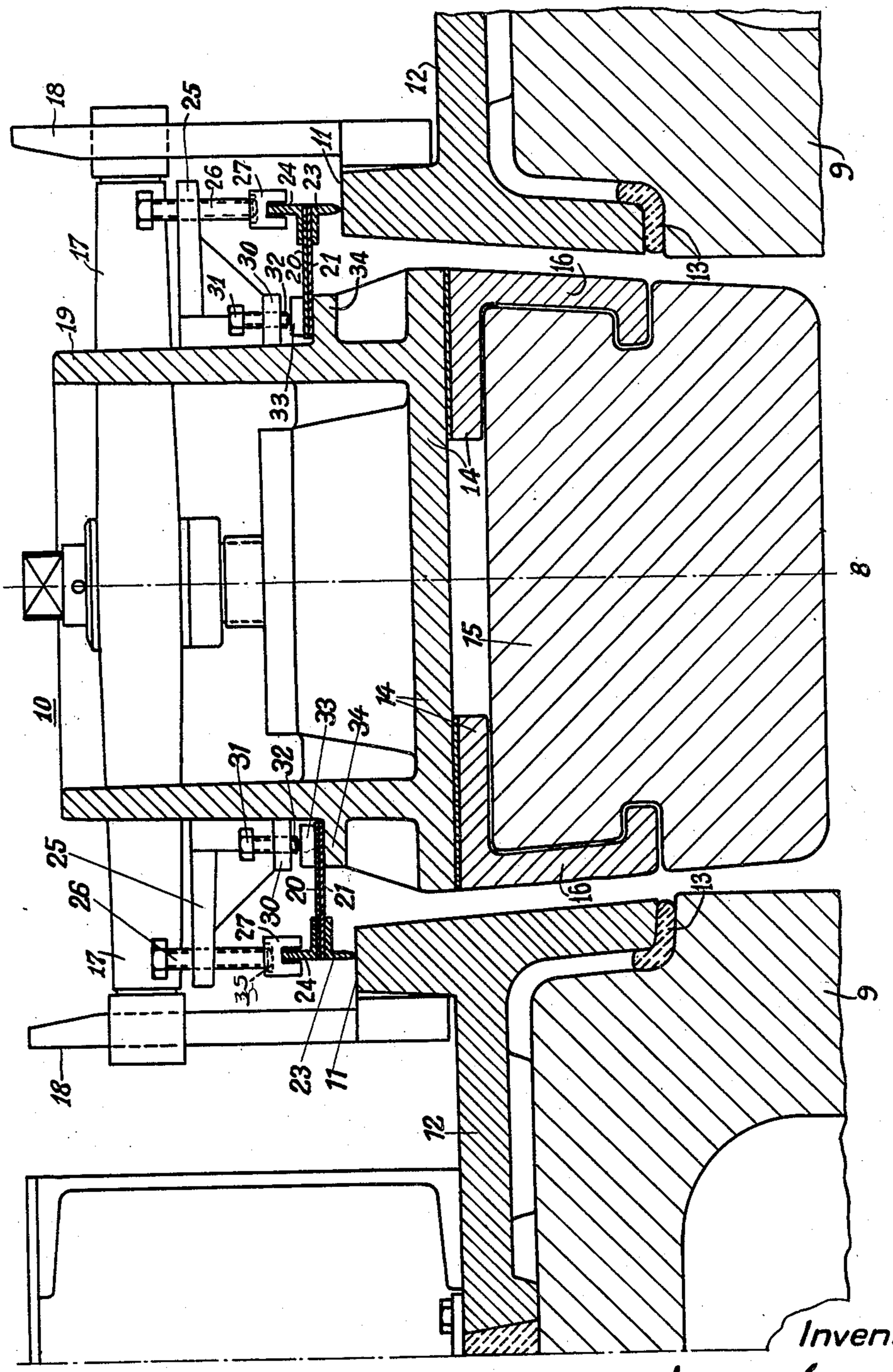
COKE OVEN DOOR

Filed April 29, 1930



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# UNITED STATES PATENT OFFICE

ERNST WOLFF, OF LINDEN-RUHR, GERMANY

## COKE OVEN DOOR

Application filed April 29, 1930, Serial No. 448,356, and in Germany October 3, 1929.

My invention relates to self-sealing doors for coke ovens.

The present invention is a modification of and an improvement upon the coke-oven door of my copending application Serial No. 391,348, filed September 9, 1929.

The prior application describes a door consisting of a rigid plate or slab with a resilient web at its rim, connecting to the rigid slab a metal frame, which is pressed against a metal door frame, for making a metal-to-metal, gas-tight joint. The most obvious method of fixing the web to the door plate consists in using bolts passing through the web, but this involves perforation of the web, which may give rise to leakage, and the bolts may become very hot, which often results in binding. Moreover, fairly large nuts must be used, screwed down very tightly, so that at intervals along the web the same is pinched so firmly that at these parts the effect of its resilience is wholly or largely lost.

According to my present invention these defects are avoided, and a very effective fastening is obtained, by fixing the web to the door plate or slab by clamping it against a portion thereof, with an asbestos packing. The clamping may be effected by means of screws screwed through lugs or flanges of the door, and these screws may have rounded tips engaging into recesses in clamping members bearing on the web and the asbestos packing.

A construction according to the invention is shown in the accompanying drawing, which is a horizontal cross section of the door and door frame.

The door of my invention is particularly adapted for use in connection with horizontal coke ovens such as the oven chamber 8 having side walls 9, only a portion of which appear in the drawing. A door 10 for the end opening of the oven chamber 8 co-operates with the plane edge 11 of a flanged door frame 12 which surrounds the end opening of the oven. The inner edge of the frame 12 is separated from the refractory side walls by packing 13 of refractory material.

The door 10 comprises a rigid body portion 14, preferably of cast-iron and a masonry slab 15 which is of suitable refractory material and is retained by inwardly extending flanges 16. The door is secured in position by one or more pivoted bars 17 which engage hooks 18 attached to the frame 12. The door is provided with an outwardly extending flange 19 to which is secured an elastic web or annular plate 20 of sheet metal and an inner protective lining 21 of asbestos.

The annular plate 20 is provided at its outer edge with a metal sealing frame 23 comprising a flange 24 extending at right angles to the plate 20. The door is provided with a series of lugs 25 carrying screws 26 that engage slotted blocks 27 for pressing the frame 23 against the plane edge or face 11 of the sealing surface of the door frame. The slots 35 are in the upper portion of blocks 27.

A series of lugs 30 carry screws 31 having rounded tips 32 for engaging clamping blocks 33 which press the plate 20 and the asbestos 21 against an outstanding flange 34 that is integral with the flange 19 and extends around the body portion of the door. The screws 31 and the blocks 33 are at such intervals that a gas-tight engagement is provided between the plate 20 and the cast-iron portion of the door. At the same time, this method of fastening permits the flexing or rocking of the plate 20 to permit the frame 23 to adjust itself to any warped or curved portion of the sealing surface 11.

An important feature of my invention is the fastening of the flexible plate to the door without perforation of the plate and the supporting flange so that leakage through such openings is prevented. At the same time, the plate is detachable in order that it may be removed for replacement or repair. The clamping screws are protected against direct contact with the heated gases and the resultant corrosive effects. Furthermore, they are easily accessible for adjustment or removal.

What I claim is:

1. The combination with a coke oven having a metal door frame provided with an outer plane sealing surface surrounding the opening in said frame, of a door for said

opening comprising a metal body portion having a flange extending therearound, a flexible plate comprising an imperforate annular portion having a heat-insulating lining and clamped to said flange by means of screws carried by said body portion, and a metal sealing frame carried by the outer edge of said plate for making a gas-tight engagement with said plane sealing surface.

2. The combination with a coke oven having a metal door frame provided with an outwardly projecting flange with a plane edge constituting a sealing surface, of a door for coacting with said frame having a metal body portion, a flexible plate comprising an imperforate annular portion surrounding said body portion and clamped thereto by screws carried thereby, and a metal sealing frame carried by the outer edge of said flexible plate for making a gas-tight engagement with the sealing surface of said door frame.

3. The combination with a coke oven having a metal door frame provided with an outer plane sealing surface surrounding the opening in said frame, of a door for said opening comprising a metal body portion, an annular flexible plate having its inner periphery clamped to said body portion, screws carried by said door for clamping said plate, and a metal sealing frame secured to the outer periphery of said plate for making a gas-tight connection to said plane sealing surface.

4. The combination with a coke oven having a metal door frame provided with an outer plane sealing surface surrounding the opening in said frame, of a door for said opening comprising a metal body portion, an annular flexible plate having its inner periphery clamped to said body portion, screws carried by said door and slotted clamping blocks for clamping said plate, said screws having rounded tips for engaging correspondingly shaped slots in said clamping blocks, and a metal sealing frame secured to the outer periphery of said plate for making a gas-tight connection to said plane sealing surface.

In witness whereof I affix my signature.

ERNST WOLFF.