

COKE OVEN DOOR STRUCTURE

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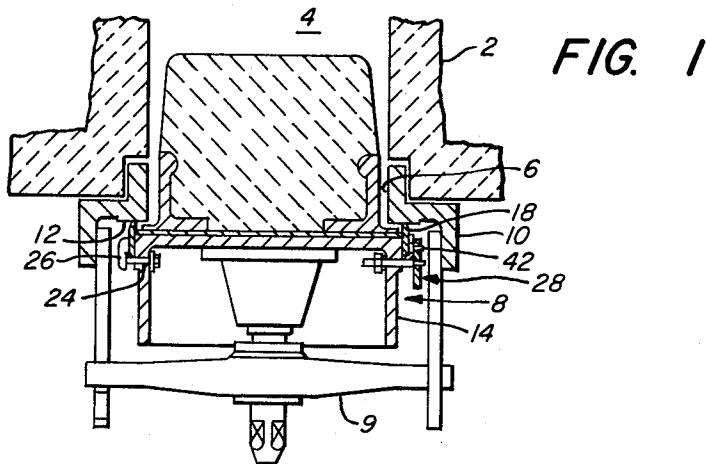


FIG. 2

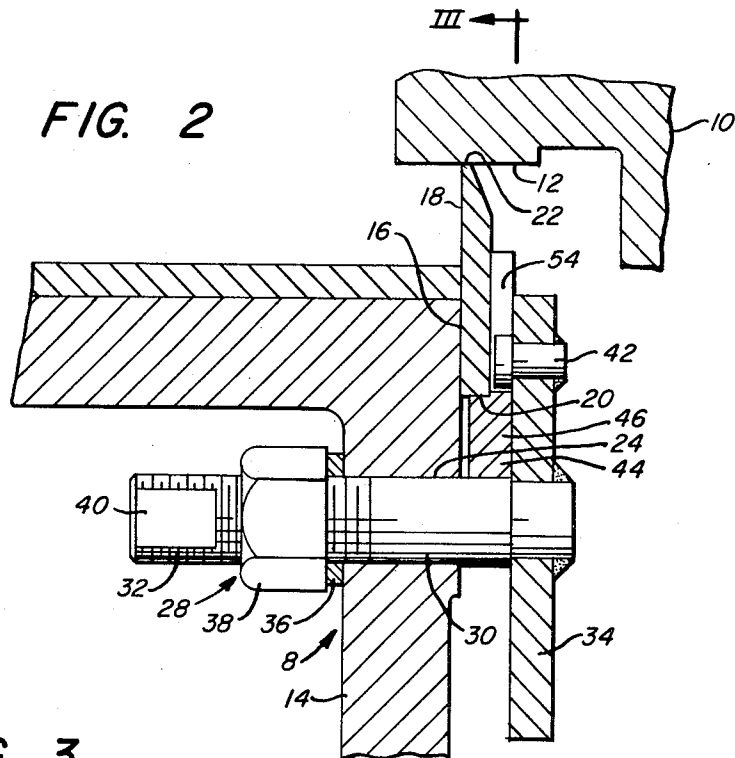
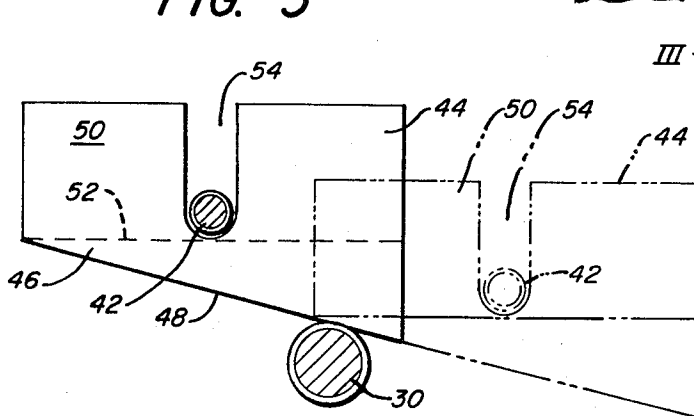


FIG. 3



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COKE OVEN DOOR STRUCTURE
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10 Claims

ABSTRACT OF THE DISCLOSURE

A coke oven door structure includes a door jamb having an outwardly facing flat sealing surface around its periphery, a rigid frame member having a peripheral surface substantially normal to said flat sealing surface, a flexible metal sealing strip extending around said door frame member in contact with said peripheral surface, and a plurality of clamping means holding the sealing strip against the sealing surface. The novel clamping means includes a shaft with a disc attached to its outer end and threads on its inner end for receiving a nut, and a wedge having a thick portion with a slanting edge, a thin portion with a slot therein and a shoulder between the thick and thin portions. The wedge is located between the disc and door frame with its slanting edge contacting the shaft and its shoulder bearing against the sealing strip to hold it against the sealing surface. The disc has a pin attached to it parallel to the shaft. The pin is secured in the slot so that turning of the shaft causes the wedge to hold the sealing strip against the sealing surface. Tightening of the nut prevents movement of the shaft and wedge.

This invention relates to a coke oven door structure and more particularly to the type of seal shown in Wolff Pat. No. 2,698,289 dated Dec. 28, 1954. The seal shown in the Wolff patent is a flexible strip which extends around the periphery of the door and is held in place on the door by means of clamps. The strip is made to conform to the shape of the sealing surface on the door jamb by progressively hammering the edge of the strip to eliminate gaps between the jamb and strip. After adjustment the strip is held in place only by means of frictional forces exerted by the clamps. This means of maintaining the adjustment is obviously unsatisfactory since the stiffness of the strip and the repeated effects of heating and cooling as well as of handling will cause the strip to move. British Pat. No. 824,035, published Nov. 25, 1959, shows a somewhat similar type of seal which has positive means for holding the seal member against the sealing surface, but this structure is more complicated and considerably more expensive to manufacture than the Wolff structure.

It is therefore an object of my invention to provide an improved sealing strip clamping device which is relatively inexpensive and which positively locks the sealing strip of a coke oven door in adjusted position.

Another object of my invention is to provide such a device which may be used in place of only some of the locking devices of the Wolff door.

Still another object is to provide such a device which is easy to operate.

These and other objects will be more apparent after referring to the following specification and attached drawings, in which:

FIG. 1 is a sectional plan view of a coke oven chamber and door;

FIG. 2 is an enlarged sectional plan view of the clamping device of my invention; and

FIG. 3 is a view taken on the line III-III of FIG. 2, but with the door frame and sealing strip omitted.

Referring more particularly to the drawings, reference numeral 2 indicates the refractory wall of a coke oven

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chamber 4 having an opening 6 which is to be closed by a door 8. The door is held in position by the usual mechanism 9 (not shown in detail) which forms no part of the present invention. A door jamb 10 surrounds the opening 6 and has an outwardly facing flat sealing surface 12 around its periphery. The door 8 includes a rigid frame member 14 having a flat peripheral surface 16 substantially normal to the surface 12. A flexible metal sealing strip 18 extends around the frame member 14 with one side in contact with surface 16, one edge 20 remote from the surface 12 and its other edge 22 adapted to contact the surface 12. The frame member 14 has a plurality of spaced apart holes 24 therein with their axes substantially parallel to surface 12 and to each other. Some of the holes 24 may have a hook bolt 26 therein for frictionally clamping the bar 18. The parts so far described are the same as in the Wolff patent.

The holes 24 normally are spaced at intervals of about six inches and it is sufficient to have every second or third hole provided with clamping devices 28 of my invention although they can be used in every hole. In FIG. 1 one hook bolt clamp 26 and one improved clamping device are shown merely for the purpose of illustration. Each device 28 includes a shaft 30 passing through a hole 24 and having threads 32 at one end and a disc 34 attached to the other end such as by welding. A lock-washer 36 and nut 38 are received on threads 32. Flat surfaces 40 are preferably provided on the outer end of threaded portion 32 to permit easy turning by means of a wrench. A pin 42 is secured to the disc 34 parallel to shaft 30 with a portion extending toward surface 16. A wedge 44 is located between the disc 34 and frame member 14. The wedge 44 includes a relatively thick section 46 having a slanting surface 48 in contact with shaft 30, a relatively thin section 50 between the disc 34 and the strip 18, and a shoulder 52 parallel to surface 12. The section 50 has a slot 54 therein extending normal to the surface 12 and shoulder 52 for receiving the pin 42. The combined thickness of the sealing strip and thin portion of the wedge is greater than the thick portion of the wedge to ensure best clamping operation.

The adjustment and clamping of strip 18 is carried out as follows: The oven door 8 is set in place and latched by latching means 9. The sealing strip 18 is driven into contact with the surface 12 by progressively hammering it around the door periphery. As the hammering proceeds, the hook bolts 26 and/or devices 28 temporarily hold the strip 18 in position. Also, as the hammering proceeds, the devices 28 are adjusted to permanently hold strip 18 in position. This is done by rotating the shaft 30 in a direction to move the wedge 44 from an extreme disengaged position shown in broken lines in FIG. 3 to the engaged position shown in solid lines. This action results from rotation of pin 42 about the axis of shaft 30 and engagement of the pin with the walls of slot 54. Further movement of wedge 44 becomes impossible when the strip 18 engages surface 12 and when thick section 46 is wedged between edge 20 and shaft 30. The nut 38 is then tightened to force disc 34 against wedge 44 which in turn bears against strip 18 to lock the entire assembly against any motion.

While one embodiment of my invention has been shown and described, it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. In a coke oven including a coking chamber having an opening at one end thereof; a door jamb surrounding said coking chamber opening and having an outwardly facing flat sealing surface around its periphery; and a door for closing said opening, said door including a rigid frame member having a peripheral surface substantially

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normal to said flat sealing surface, a flexible metal sealing strip extending around said door frame member in contact with said peripheral surface, said sealing strip having a first edge remote from said sealing surface and a second edge adapted to contact said sealing surface, said door frame having spaced holes therein with their axes substantially parallel to each other and to said sealing surface, and a plurality of clamping means secured in said holes and holding the second edge of said sealing strip against said sealing surface when said door is in place to close said opening; the improvement in said clamping means comprising a shaft rotatably mounted in said hole and extending from both ends thereof; a disc secured on the outer end of said shaft; a wedge located between said disc and said door frame member, said wedge having a slanting surface in contact with said shaft, an elongated surface parallel to said sealing surface in contact with said first edge of said sealing strip, said wedge having a slot therein extending normal to said sealing surface; means on said disc receivable in said slot for moving said wedge toward and away from said sealing surface when said shaft is rotated; and means on the other end of said shaft for holding said shaft in adjusted position.

2. The assembly of claim 1 in which said means on the other end of said shaft for holding said shaft in adjusted position includes threads on said shaft, and a nut threaded on said threads.

3. The assembly of claim 1 in which said means on said disc receivable in said slot for moving said wedge includes a pin secured on said disc parallel to said shaft and having a portion extending toward said peripheral surface.

4. The assembly of claim 3 in which said means on the other end of said shaft for holding said shaft in adjusted position includes threads on said shaft, and a nut threaded on said threads.

5. The assembly of claim 1 in which said wedge includes a relatively thick section having said slanting surface thereon, a relatively thin section between said disc and said sealing strip, and a shoulder between said thin and thick sections forming said surface parallel to said sealing surface.

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6. The assembly of claim 5 in which said means on said disc receivable in said slot for moving said wedge includes a pin secured on said disc parallel to said shaft, and having a portion extending toward said peripheral surface.

7. The assembly of claim 6 in which said means on the other end of said shaft for holding said shaft in adjusted position includes threads on said shaft, and a nut threaded on said threads.

8. The assembly of claim 5 in which the combined thickness of the sealing strip and thin portion of the wedge is greater than the thick portion of the wedge.

9. The assembly of claim 8 in which said means on said disc receivable in said slot for moving said wedge includes a pin secured on said disc parallel to said shaft, and having a portion extending toward said peripheral surface.

10. The assembly of claim 9 in which said means on the other end of said shaft for holding said shaft in adjusted position includes threads on said shaft, and a nut threaded on said threads.

References Cited

UNITED STATES PATENTS

2,698,289	12/1954	Wolff	202—248 UX
2,778,784	1/1957	Otto	202—248
3,385,771	5/1968	Stanke	202—248
1,558,954	10/1925	Walker	49—320

FOREIGN PATENTS

563,285	2/1935	Germany	202—248
410,406	3/1910	France	49—320
906,091	3/1954	Germany	202—248

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