

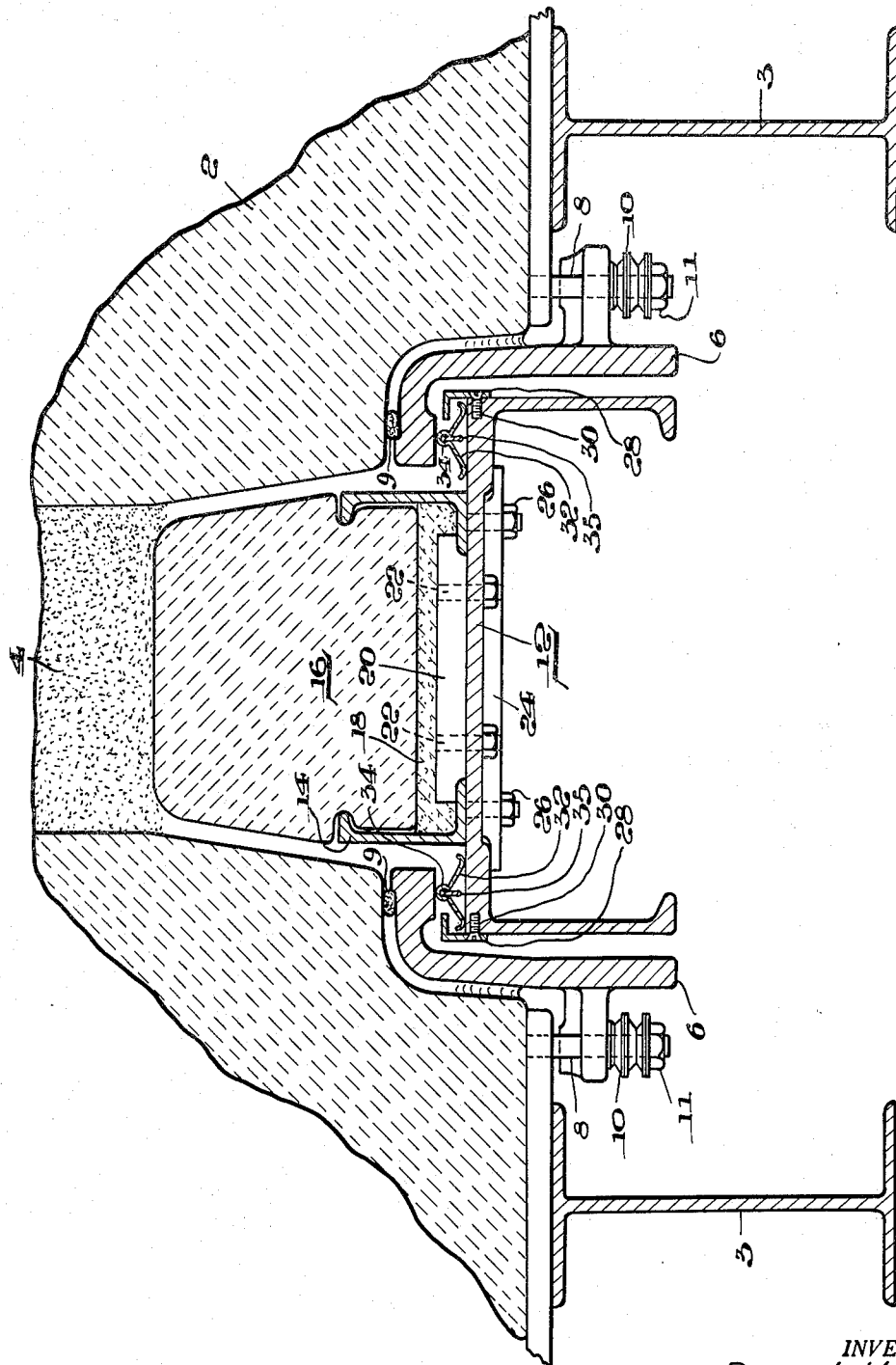
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FLOATING, RESILIENT SEALING FRAME FOR COKE OVEN DOORS

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FLOATING, RESILIENT SEALING FRAME FOR COKE OVEN DOORS

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The present invention relates to oven doors and more particularly to a compressible self-sealing apparatus for a coke oven door.

In the prior art various devices have been used with a coke oven door to obtain effective sealing conditions when the door is pushed closed against the doorjamb frame of the coking chamber. For example, knifeblades have been mounted along the periphery of the door to contact a sealing surface provided on the doorjamb frame. Other arrangements such as a jointing metallic seal having a rounded surface for contacting the sealing surface of the doorjamb frame, the seal being attached to a sealing frame that is clamped to the body of the door, have also been suggested.

The present invention provides an improved self-sealing device that permits the maintenance of uniform contact throughout regardless of any warping that might occur due to the high temperatures of the coke oven.

Another feature of the present invention is to provide a coke oven door which has a self-sealing device that can be readily removed and replaced.

Still another feature of the present invention is to provide a coke oven door which has a compressible sealing device that is held in place even though the door is not in contact with the doorjamb frame.

Another feature of the present invention is to provide a coke oven door which has a compressible self-sealing device that is economical in its maintenance and construction.

More particularly, the present invention provides in combination with a coke oven door adapted to cooperate in parallelism with a coking chamber doorjamb frame having an outer plane sealing surface surrounding the opening therethrough, a readily removable and accessible resilient sealing frame member floatingly positioned as a freely bodily movable element in a removable retainer frame therefor, on the door between that side of the door facing the coking chamber and the sealing surface of the doorjamb frame, with the portion of the sealing frame that contacts the sealing surface on the door jamb frame always exposed in both the on and off positions of the door, a tight seal being obtained between the door and the doorjamb frame when the door is pushed to closed position regardless of any planar distortions that might exist in the doorjamb frame and the door.

It will be obvious to one skilled in the art that various changes can be made in the arrangement, form, construction and type of the elements disclosed hereinafter without departing from the scope or spirit of this invention.

Reference will now be made to the accompanying drawing which illustrates and exemplifies an embodiment of the apparatus of the invention in a preferred type of construction.

In the drawing, a portion of coke oven 2 is disclosed having buckstays 3 mounted on the outer wall thereof as is well-known in the art. Positioned at one end of a coking chamber 4 in the coke oven is the doorjamb frame 6 which is mounted on the wall of the coke oven 2 by

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means of the bolts 8, nuts 11, and spring washers 10. As is also well known in the art, asbestos insulating material 9 is provided between the doorjamb frame and the oven wall.

Cooperating with the doorjamb frame 6 is a door 12. A refractory door plug 16 which fits into the entrance of chamber 4 is held on the door 12 by means of the retainer angle frame member 14 fixed to the door. The door is provided further with a rear clamping plate 20, held thereto by means of bolts 22. Positioned between clamping plate 20 and the plug 16 is refractory insulating material 18. A front clamping plate 24 is held on the door 12 by means of nut and bolt assemblies 26. Since the aforescribed structure is well known in the art, further details are not given herein.

Attached to the outer periphery of the door 12 by means of removable bolts 30 is one leg of a removable sealing ring retainer frame 28, the frame being so positioned that the other leg turns inwardly in a direction toward the refractory plug 16 to form a slot between itself and that surface of the door which faces the coking chamber. Floatingly positioned within this slot, as shown on the drawing, in overlapping relation with the other leg of the removable sealing ring retainer frame is one leg of a sealing ring, preferably in the form of a resilient sealing frame member, and more specifically one in the form of a spring clip sealing ring member 32. The sealing ring 32 has a rounded head portion 34 that is adapted for parallel contact with the conventional sealing surface therefor on the doorjamb frame 6 as shown, when the door is pushed closed. A steel bar 35 is positioned at the center of sealing ring 32 to prevent the sealing ring from being deformed past its elastic limit. It is to be understood that various shaped resilient members can be utilized in place of the spring clip disclosed to cooperate with the door and jamb frame as a sealing member upon closing the door and to be floatingly positioned upon the door when it is opened.

It is to be understood further that the sealing ring retainer frame 28 and the spring clip sealing ring 32 extend completely around the outer periphery of the door. When the door is closed and the sealing ring compressed, latches are dropped into position, as is well known in the art, to hold the door tightly against the jamb frame 6. Any number of latches may be used with the present invention; however, in a preferred embodiment five (5) latches are provided in order to insure a uniform pressure against the sealing member along the full height of the door.

It is to be noted that although only a spring clip sealing member is disclosed with diverging legs, other types of resilient sealing members can also be used. For example, silicon rubber or other plastic material designed to withstand high temperature can be used. The resiliency of such sealing rings permits a uniform contact throughout, providing a tight seal regardless of any differential warping which might take place during coking operations.

The invention claimed is:

1. In combination with a coke oven door adapted to cooperate with a coking chamber door jamb frame having an outer plane sealing surface surrounding the opening therethrough, a resilient sealing frame in parallelism with said sealing surface and positioned on said door in floating relation thereon between that side of said door facing said coking chamber and said sealing surface of said door jamb frame, a tight seal being obtained between said door and said door jamb frame when said door is pushed to closed position regardless of any planar distortions that might exist in said door jamb frame and said door, and removable means for retaining the resilient sealing frame in position for sealing on the door while allowing for

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its floating action thereon as a freely bodily movable element with the portion of the sealing frame that contacts the sealing surface on the door jamb frame always exposed in both the on and off positions of the door.

2. In combination with a coke oven door adapted to cooperate with a coking chamber door jamb frame having an outer plane sealing surface surrounding the opening therethrough, a sealing ring retainer frame providing a retaining slot and removably positioned along the periphery of said door on the side thereof which faces the coking chamber, a resilient sealing ring floatingly mounted in said slot in position to cooperate parallelly with said sealing surface of said door jamb frame to form a tight seal between the door and the frame when said door is closed regardless of any planar distortions that might exist in said door jamb frame and said door, the portions of the resilient sealing ring when in said slot being of lesser thickness than the depth of the slot, for free movement bodily as an element therein, and the remaining portion of the resilient sealing ring that contacts the sealing surface on the door jamb frame always being exposed in both the on and off positions of the door.

3. The apparatus of claim 2, and in which said sealing ring retainer frame is constituted of an angle member, one leg of which is removably attached to the periphery of said door and the other leg of which overlaps the resilient sealing ring and forms a slot, between itself and that

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surface of said door which faces the coking chamber, of a depth greater than the depth of the resilient sealing ring that it overlaps for free movement of the resilient sealing ring bodily as a unitary whole relative to the angle member and the rest of the door.

4. The apparatus of claim 2, and in which said resilient sealing ring comprises a spring clip having outwardly diverging legs with one leg adapted to overlap in floating relation in the slot of the sealing ring retainer frame.

5. The apparatus of claim 3, and a spring limiting means in said slot adapted to limit said resilient sealing ring against deformation past its elastic limit.

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