Feb. 8, 1938. A. D. OLDS 2,107,762

SEALING MEANS FOR HEATER DOORS

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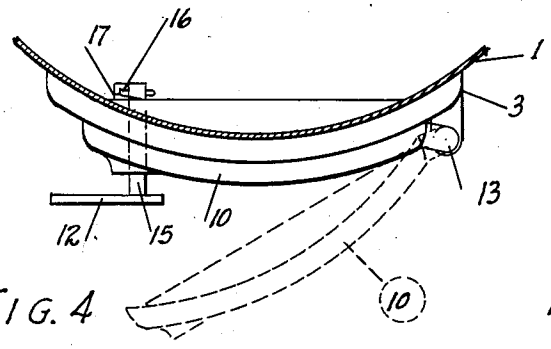


FIG. 4

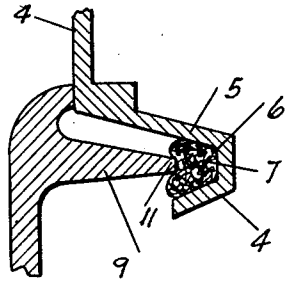


FIG. 5

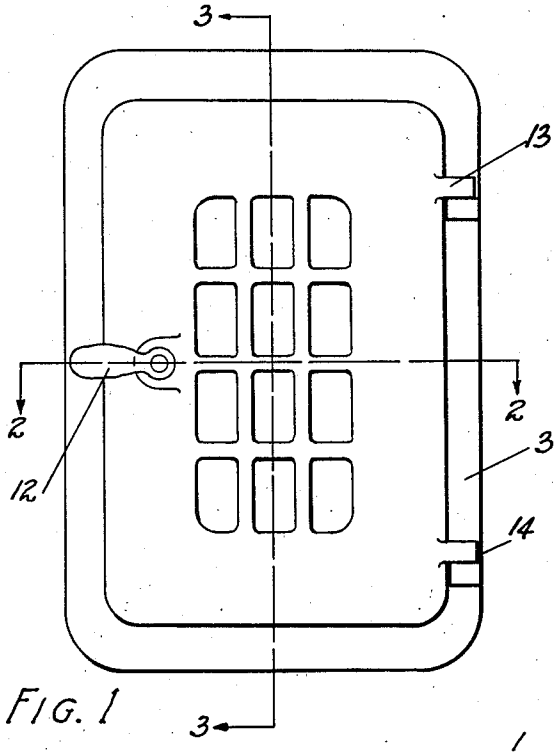


FIG. 1

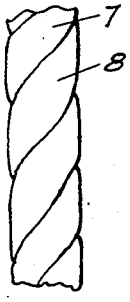


FIG. 6

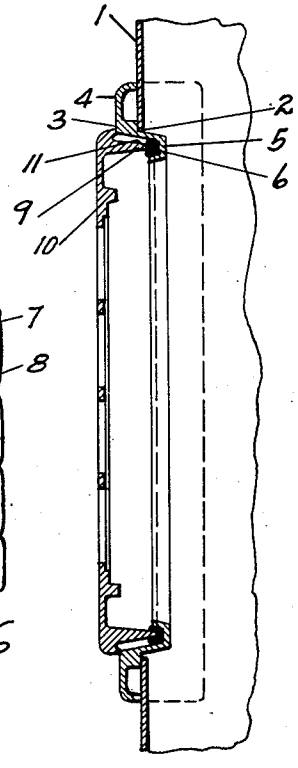


FIG. 3

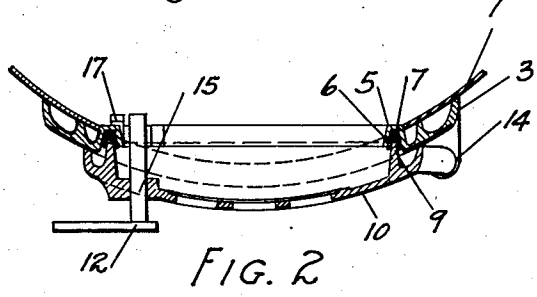


FIG. 2

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SEALING MEANS FOR HEATER DOORS

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Application August 21, 1935, Serial No. 37,127

1 Claim. (Cl. 110—173)

This invention relates to sealing means for heater doors and while it is particularly designed for use in connection with oil heaters it is not necessarily limited in all its aspects to that particular use. Various types of heaters have cast iron doors for the heating chamber or combustion chamber. These doors warp under heat because of the inherent tendency for cast iron to "grow", so it is difficult to seal the joint between the door and the frame. Attempts have been made to effect a seal by machining the face of the frame and face of the door so that when the door is closed a tight joint will be made, but in actual practice it has been found that the door, the frame or both will "grow" under high temperatures so that cracks or breaks occur in the joint, admitting extraneous air into the heater. It is well understood that heaters are designed to admit the necessary amount of air to combine with the fuel to effect the best combustion. If extraneous or outside air is admitted into the heater the amount of heat required to raise the temperature of the extraneous air cuts down the efficiency of the heater in proportion to the amount of extraneous air admitted.

It is the purpose of my invention to effect a tight joint or seal at the door opening so the above objection will be reduced to a minimum if not wholly eliminated. To this end I have provided two members, one a door and the other a frame so corelated that one will be a male member and the other a female member. The female member is provided with a soft packing which will withstand high temperatures and will be yielding enough to permit the male member to contact with it and expand it in the female member sufficiently to effect an air tight seal. Therefore, the difficulty above enumerated will be avoided.

The novelty of the invention will be understood by reference to the following description in connection with the accompanying drawing in which,

Figure 1 is a front elevational view of a door frame and door constructed in accordance with my invention,

Figure 2 is a cross sectional view on the line 2—2 of Figure 1 with part of the heater wall,

Figure 3 is a vertical, section on the line 3—3 of Figure 1, showing part of the heater wall,

Figure 4 is a top edge view of the frame and door, part of the heater being shown in cross section,

Figure 5 is an enlarged detailed view of a portion of the joint, and

Figure 6 is a detail view of one form of packing.

Referring now to the drawing by numerals of reference, 1 designates a portion of the heater casing shown as circular. The casing is provided with a door opening 2 surrounded by a door frame 3 formed with a door engaging seat 4 having an inwardly projecting flange 5 provided with a groove 6 extending entirely around the inner edge of the frame, the groove being provided with outwardly diverging walls to receive a soft packing 7. The particular packing recommended is commonly known as asbestos rope packing although I do not wish to be limited to the particular form of packing illustrated in Figure 6. The rope packing recommended consists of a plurality of strands 8, wound in the form of a rope but loose enough to permit it to yield or expand when subjected to pressure from the flange 9 on the door 10. The flange 9 is spaced inwardly from the flange 5 to form an expansion space to accommodate any distortion that may occur in the door and frame incidental to heating. The perimetric outer edge of the door forms a seating face to engage the seat 4 on the frame after the flange has engaged the packing. The flange 9 has converging sides so that the edge 11 is narrower than the remaining portion of the flange to permit it to imbed itself into the packing when the door is closed and held fast by a suitable latch 12. The door is hinged on the frame at 13 and 14.

In view of the fact that the flange of the door may imbed itself in the soft packing and inasmuch as the fibre packing is yielding in the groove, it is obvious that the flange will act as a wedge so that the joint will be tight irrespective of distortion or warping of either the frame or the door under high temperatures and inasmuch as the packing is adapted to withstand high temperatures it will not deteriorate in use. Therefore, liability of extraneous or outside air being admitted into the heater to cut down its efficiency will be eliminated so in operation the objections heretofore noted to heaters now generally employed will be eliminated.

In actual practice I prefer to use a latch of the cam type so that the flange on the door can be drawn down into the groove against the packing. I have, therefore, shown the latch as having a shaft 15 with a cam member 16 which will ride over the part 17 on the frame. Therefore, the door can be drawn by the cam so that the flange will wedge into and intimately contact the packing at all points. Attention is directed to the fact that the door flange 9 is of such depth relatively to the perimetric seating portion of the

door that the packing is engaged and compressed by the time the door engages the seat 4.

This invention has been particularly designed for use with oil heaters because the above noted objection is more apparent in oil heaters than other types but so far as the joint is concerned it may be used to advantage in other types of heaters and under certain conditions the door may be provided with a groove and the frame with the bead or flange, the essential feature of the invention being the inclusion of a soft packing in a groove which will not deteriorate under high temperatures and which will cooperate with a complementary member to effect an air tight seal at the door opening.

What I claim is:

In a door for heater casings, a door frame having a laterally extending flange forming a door opening and provided with a door engaging seat surrounding said opening, said lateral flange having a continuous groove inset from the plane of said door engaging seat and surrounding said opening, a soft and resilient fibrous packing material inset within said groove, a door hinged to the frame and having a perimetric seating portion for engaging said seat on the frame, means hinging the door to the frame, a flange on the door and spaced from the lateral flange of the door frame to form an expansion space to accommodate any distortion that may occur in the door and frame incidental to heating, said door flange having a depth relatively to said perimetric seating portion of the door to make contact with said fibrous material prior to engagement of said perimetric portion with the seat when the door is being moved to closed position whereby said material is compressed by said door flange against the sides and bottom of the groove and a portion thereof displaced into the space between said flanges to seal the door relatively to the frame, and clamping means for clampingly retaining the door in closed position on the frame.

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