

May 14, 1940.

H. J. SANDS

2,200,304

HEATER

Filed Oct. 22, 1938

Fig. 1

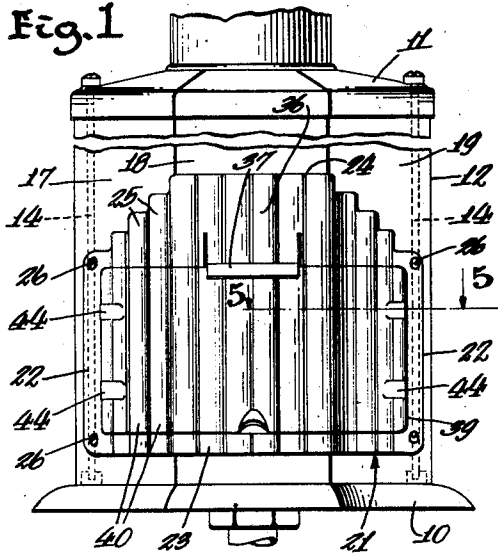


Fig. 4

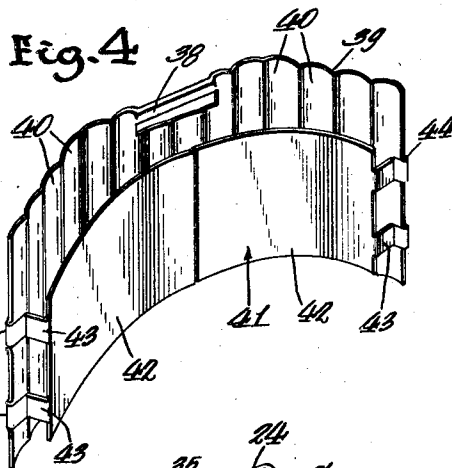


Fig. 6



Fig. 3

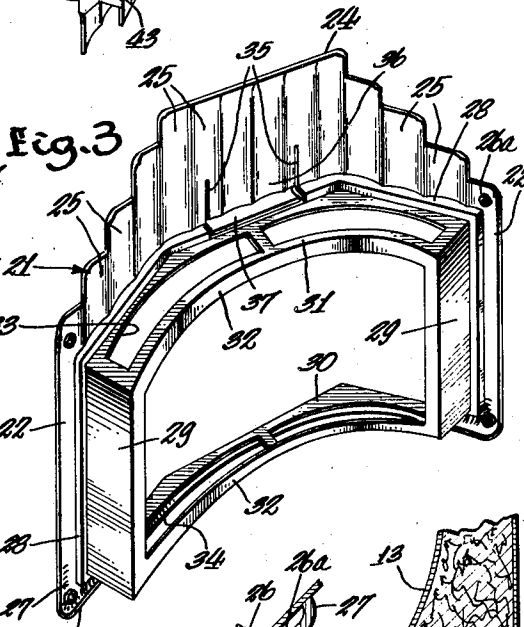


Fig. 2

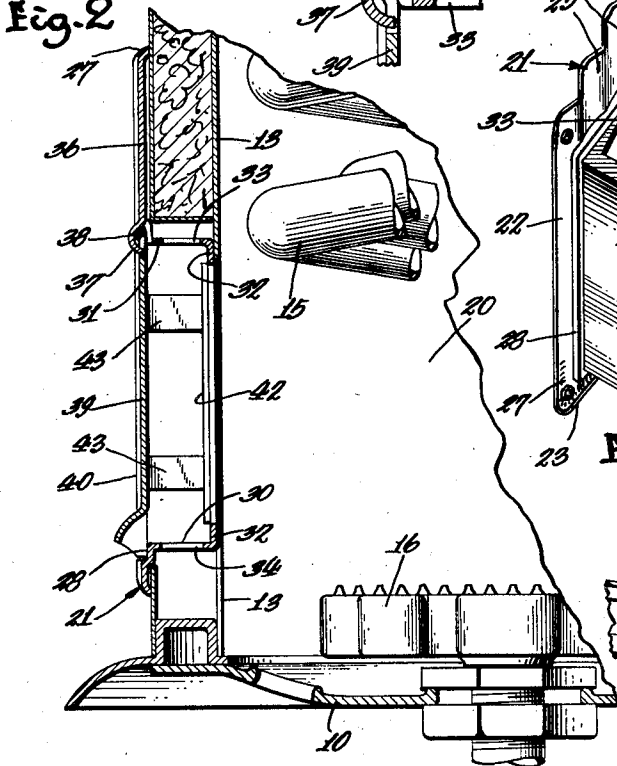


Fig. 7

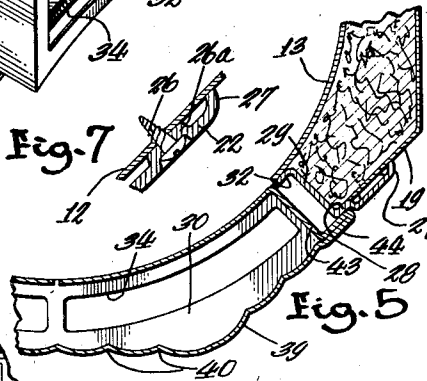


Fig. 5

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UNITED STATES PATENT OFFICE

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HEATER

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Application October 22, 1938, Serial No. 236,524

8 Claims. (Cl. 126—190)

This invention relates to heaters, more particularly hot water heaters, and has for an object the provision of a new and improved heater of this character, and wherein means are provided for preventing scorching or burning or other defacement of the casing of the heater, or the finish thereof.

Other and further objects of the invention will be apparent to those skilled in the art from the following description of the drawing in which:

Figure 1 is a broken, front elevational view of the heater construction,

Figure 2 is an enlarged, fragmentary, vertical sectional view of the heater construction,

Figure 3 is an enlarged, perspective view of the door frame construction employed in connection with the invention,

Figure 4 is an enlarged, perspective view of a door construction employed in connection with the invention,

Figure 5 is an enlarged horizontal sectional view of the invention, corresponding substantially to the line 5—5 of Figure 1,

Figure 6 is an enlarged, fragmentary, vertical sectional view of the door mounting construction, while

Figure 7 is a fragmentary, enlarged horizontal sectional view of the manner in which the door frame is secured to the heater construction.

As shown in the drawing, the heater construction comprises perforated base means 10, a top 11, an outer casing 12, preferably octagonal in cross-section, and an inner casing 13, preferably cylindrical in cross-section, the casings 12 and 13 having suitable insulating material therebetween, and being clamped in assembled relation by means of tie rods 14, a coil 15 being employed to conduct the water through the heater, and a burner 16 to heat the coil 15, the structural characteristics of the heater thus far described preferably being of a character described in detail in my co-pending application, Serial Number 233,692, filed October 6, 1938.

The door construction, more particularly forming the subject matter of the present invention, may be used in any situation where it might prove to be useful, but preferably is employed in a heater construction of the character above referred to, wherein three sides 17, 18 and 19 of the octagonal outer casing 12, are cut out to provide a horizontally extending, oblong rectangular, door opening, leading to the combustion chamber 20, wherein the gas burner

16 is situated. The door opening is surrounded on the outside of the casing 12, by a frame 21, preferably of sheet metal, having vertically extending sections 22—22, a bottom connecting section 23, and a top connecting section 24, these sections being shaped to conform to the polygonal formation of the casing 12. The sections 22, 23, and 24 are all preferably provided with vertical embossments 25, for the purpose of strengthening the frame 21, and to provide an attractive appearance, but mainly for the purpose of spacing the major portion of the frame from the casing 12 to provide air spaces and minimum contact, to thereby prevent ready conduction of heat from the door frame to the adjacent portions of the casing 12, the side sections being secured to the casing wall by self-tapping screws 26, extending through bosses, as at 26a (Figure 7), which form substantially the only contact of the frame 21 with the casing, while the marginal edges of the frame are turned slightly inwardly, as at 27, to overlies the ends of the embossments and close the spaces which otherwise would appear between the frame and the casing. The upper section 24 preferably is considerably wider than the remainder of the frame, and the top edge is given a so-called cascade effect by the stepped formation shown.

Around the inner margin of the frame 21 defining the door opening, the material is offset inwardly to form a seat 28 for the door means, hereinafter described, the seat 28 being provided for the purpose of disposing the door flush with the outer surface of the casing 12. The metal of the frame, at the inner extremity of the door seat 28 is directed inwardly to form side webs 29—29, bottom web 30, and a top web 31, and each of these webs is provided with an angularly turned flange 32 against which the inner casing 13 is adapted to rest. The top and bottom webs 31 and 30 are provided with vertically aligned slots 33 and 34, the parts defining the slots preferably being stiffened by connecting pieces if desired, the slots 33 and 34 serving to provide passage for cooling air in a manner hereinafter pointed out.

A portion of the upper section 24, preferably just above the web 30, is provided with a pair of spaced slits 35 forming a resilient tongue 36, the end of which is provided with an arcuate portion 37 beneath which is adapted to be received what might be called pintle means 38 of a door plate 39, the pintle means 38 comprising a struck-out part of the door plate, titled in clockwise fashion, as shown in Figure 6, so that resilient

force is always acting upon the pintle means 38 to hold the door plate 39 closed. Of course when the door construction is swung about the pintle means 38 to an open position, it is held open by the same resilient force of the tongue 38 normally acting to hold the door construction closed, so that to open the door plate 39, it is necessary only to flip the same in an opening direction past center and the door plate 39 will stay open. The lower edge of the door plate 39 is embossed to form a finger hold by means of which the same may be conveniently manipulated, and the door plate is further embossed to form vertical corrugations or embossments 40 in the same manner and for the same purpose as those formed in the door frame, that is, to reduce the contacting surfaces and cut down conduction of the heat to the frame 21, the embossments 40 being formed to lie vertically in line with the embossments 25.

Preferably formed integrally with the door plate 39, and spaced rearwardly therefrom, in substantially parallel relation, are passage defining, or shield means 41, preferably comprising a pair of metallic plates 42 with the inner edges juxtaposed, and the outer edges of each carried by integrally connected webs 43, which are somewhat offset, as at 44 to enable the door construction to fit nicely into position, the space between the door plate 39 proper, and the shield plates 42, being aligned, when the door is closed, with the top and bottom slots 33 and 34 of the door frame construction, thereby bringing about a circulation of air in and through the entire door and door frame construction, resulting in cooling of the same, and thereby preventing transmission of sufficient heat to the heater casings to cause damage to the door construction, the adjacent portions of the casing, or the finish thereof.

By the above described arrangement, when the door is closed, air passes upwardly between the door plate 39 and the shield plates 42, cooling the same, and also cooling the entire door frame structure, and by reason of the corrugated formation of the door and door frame construction, contacting surfaces tending to conduct the heat are greatly decreased, all resulting in a cool door and door frame arrangement which will not transmit sufficient heat to cause injury to itself or to the heater casings. Additionally the hinged arrangement for the door structure enables the door to be flipped open, and when so opened, it will remain open, until manually returned to its closed position, and in its closed position is resiliently held firmly closed as will be understood.

It will be apparent to those skilled in the art that I have accomplished at least the principal object of my invention, and it also will be apparent to those skilled in the art that the embodiment herein described may be variously changed and modified, without departing from the spirit of the invention, and that the invention is capable of uses and has advantages not herein specifically described; hence it will be appreciated that the herein disclosed embodiment is illustrative only, and that my invention is not limited thereto.

I claim:

1. A heater construction having an interior combustion chamber, and a door opening leading to said combustion chamber; door means and door supporting means; a hinged connection between said door supporting means and said door means, said connection including a pintle element on one of said means and a resilient ele-

ment on the other of said means for the pivotal reception of said pintle element, said hinged connection being constructed and arranged so that said door means are held either opened or closed depending upon the position of said door means.

2. A heater construction having an interior combustion chamber, and a door opening leading to said combustion chamber; and door means for closing said door opening, said door means having embossments therein constructed and arranged to present a minimum of contacting surface to said heater construction, and said door means being also constructed and arranged to define passages for the circulation of air thereabout, and with said limited contacting surfaces, serving to minimize transmission of heat from said door means to the remainder of said heater construction.

3. A heater construction having an interior combustion chamber, and a door opening leading to said combustion chamber; and door means for closing said door opening, said door means including a door frame having embossments therein constructed and arranged to present a minimum of contacting surface to said heater construction, and a door having embossment means presenting minimum contacting surfaces to said frame, said door means also having means constructed and arranged to define passages for the circulation of air thereabout, and with said limited contacting surfaces, serving to minimize transmission of heat from said door means to the remainder of said heater construction.

4. A heater construction having an interior combustion chamber, and a door opening leading to said combustion chamber; and door means for closing said door opening, said door means including a frame having embossment means therein constructed and arranged to present limited contacting surface to said heater construction, and a door having embossment means presenting limited contacting surfaces to said frame; said door and said door frame having means constructed and arranged to define passages for the circulation of air thereabout, and with said limited contacting surfaces, serving to minimize transmission of heat from said door means to the remainder of said heater construction.

5. A heater construction having an interior combustion chamber, and a door opening leading to said combustion chamber; and door means for closing said door opening, said door means having embossments therein constructed and arranged to present a minimum of contacting surface to said heater construction, and said door means being also constructed and arranged to define passages for the circulation of air thereabout, and with said limited contacting surfaces, serving to minimize transmission of heat from said door means to the remainder of said heater construction; and means for movably supporting said door means for opening and closing movements, said means being constructed and arranged to hold said door means open or closed depending upon the position thereof.

6. A heater construction having an interior combustion chamber, and a door opening leading to said combustion chamber; and door means for closing said door opening, said door means including a frame having embossment means therein constructed and arranged to present limited contacting surfaces to said heater construction, and a door having embossment means presenting limited contacting surfaces to said

frame; said door frame being provided with inwardly directed webs defining the door opening, and having apertures to provide first air passages, and said door having inwardly spaced means defining air passage means communicable with said first air passages, said air passages providing for circulation of air, and with said limited contacting surfaces, serving to minimize transmission of heat from said door means to the remainder of said heater construction.

7. A heater construction having an interior combustion chamber, and a door opening leading to said combustion chamber; and door means for closing said door opening, said door means including a frame having resilient supporting means adjacent the door opening, and having embossment means constructed and arranged to present limited contacting surfaces to said heater construction, and a door having means cooperating with said resilient means, to hold said door open or closed depending upon its position, said door having embossment means presenting limited contacting surfaces to said frame; said door frame also being provided with inwardly directed webs defining the door opening, and having apertures to provide first air passages, and said door having inwardly spaced means defining an air passage communicable with said first air passages, said

air passages providing for circulation of air, and with said limited contacting surfaces, serving to minimize transmission of heat from said door means to the remainder of said heater construction.

8. A heater construction having an inner and outer casing with insulation therebetween, said heater construction having an interior combustion chamber, and a door opening leading through both casings to said combustion chamber; and door means for closing said door opening, said door means including a frame secured to said outer casing having embossment means therein constructed and arranged to present limited contacting surface to said outer casing, and a door having embossment means presenting limited contacting surfaces to said frame; said door frame being provided with inwardly directed webs defining the door opening, apertures to provide first air passages, and said door having inwardly spaced means defining an air passage communicable with said first air passages, said air passages providing for circulation of air, and with said limited contacting surfaces, serving to minimize transmission of heat from said door means to said outer casing.

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