Aug. 2, 1932. G. H. McFADDEN 1,869,763

GAS HEATER

Filed May 19, 1931 3 Sheets-Sheet 1

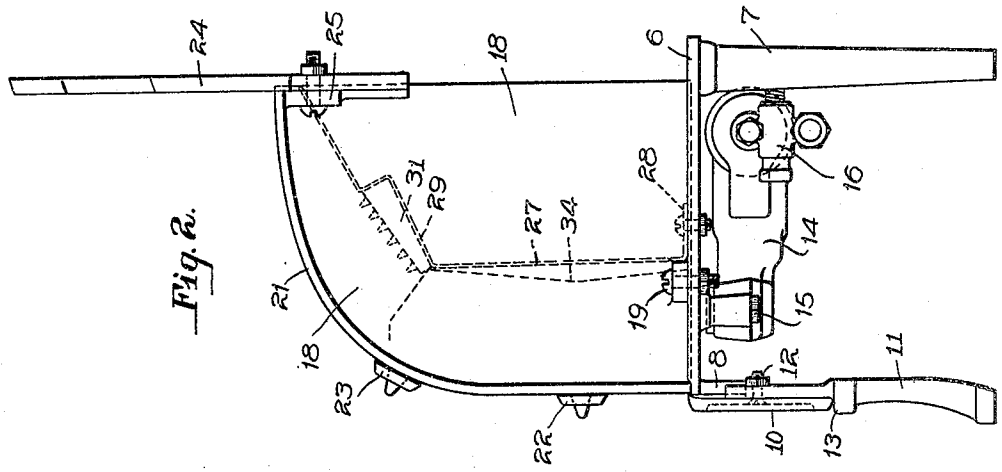


Fig. 2.

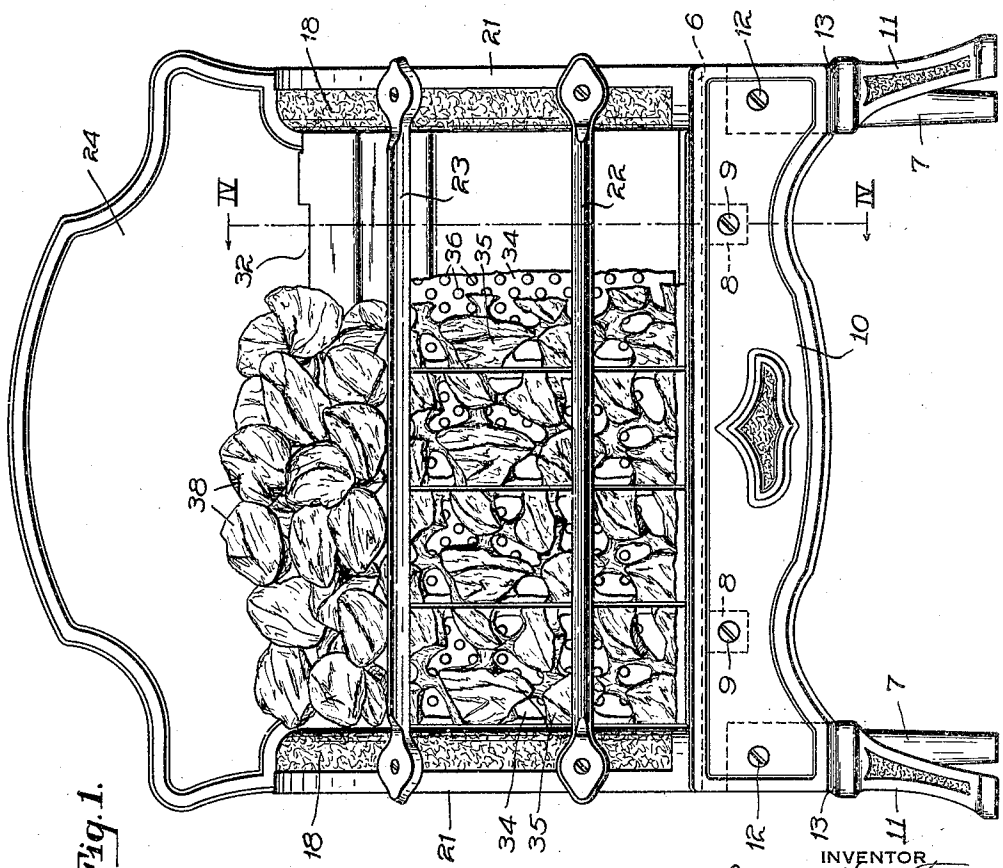


Fig. 1.

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GAS HEATER

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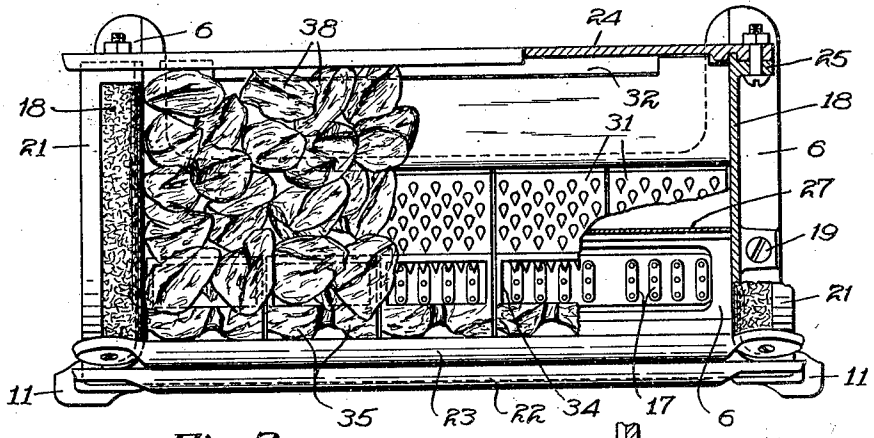


Fig. 3.

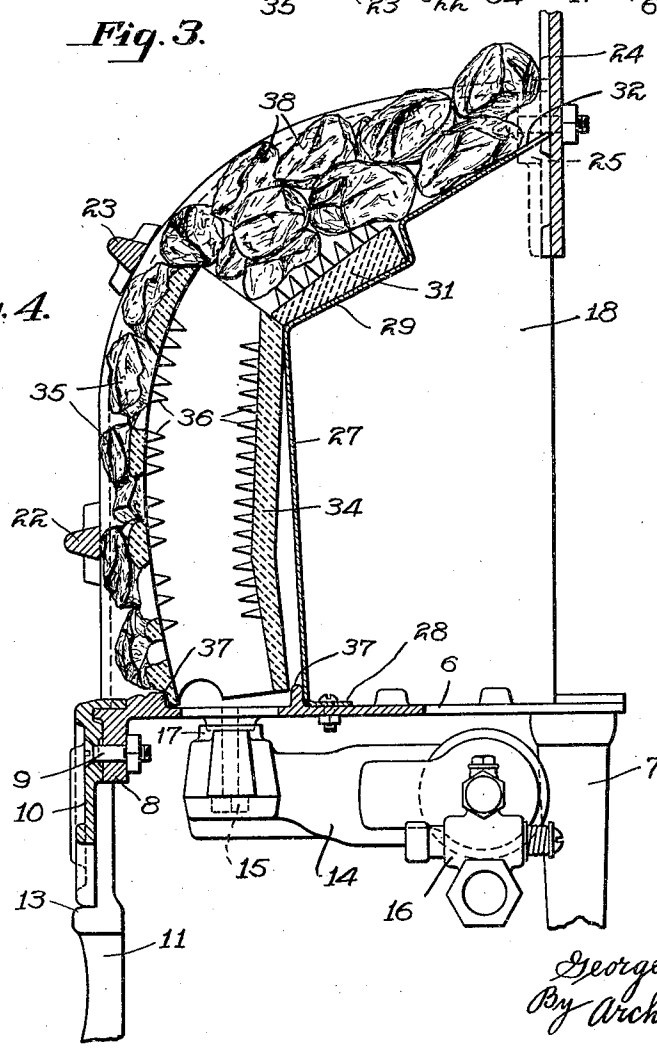


Fig. 4.

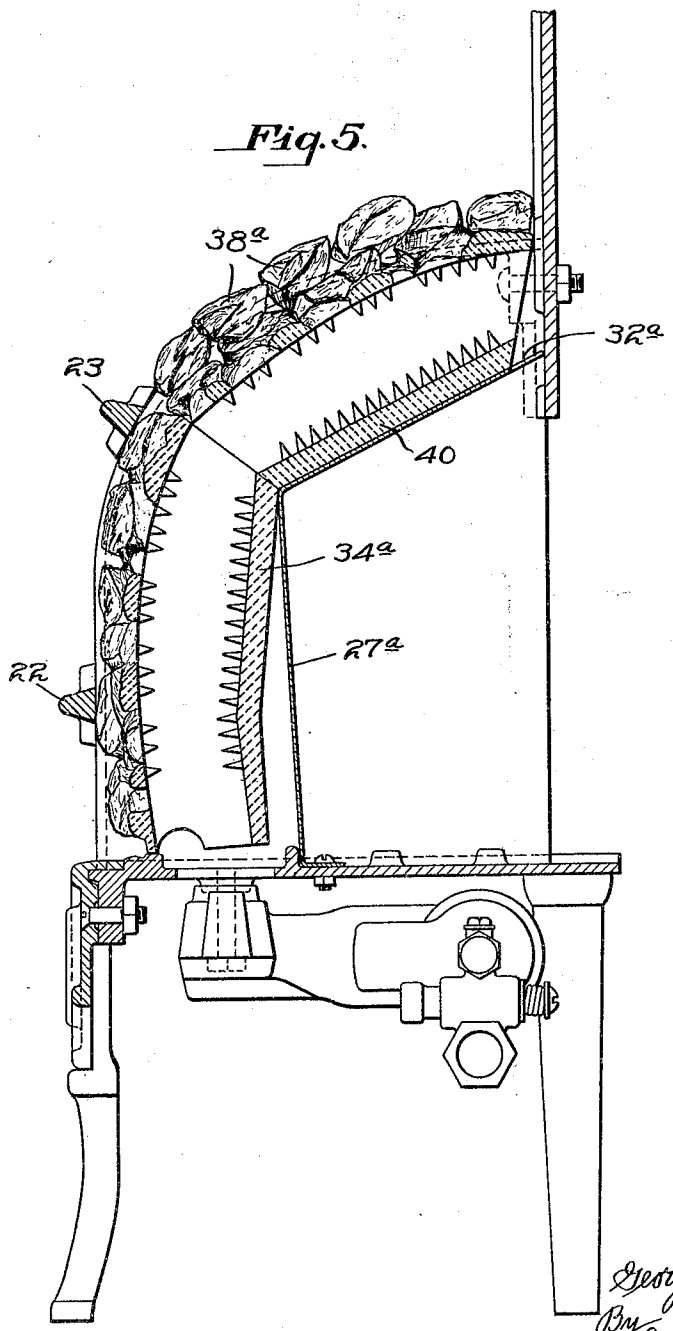
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GAS HEATER

Filed May 19, 1931 3 Sheets-Sheet 3

Fig. 5.



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UNITED STATES PATENT OFFICE

GEORGE H. McFADDEN, OF STEUBENVILLE, OHIO, ASSIGNOR TO THE OHIO FOUNDRY & MANUFACTURING COMPANY, OF STEUBENVILLE, OHIO, A CORPORATION OF OHIO

GAS HEATER

Application filed May 19, 1931. Serial No. 538,436.

My invention relates to gas heaters and more particularly to those of the radiant type wherein refractory clay elements such as burner tubes or radiants are employed for effecting sufficient combustion of the fuel and radiation of the heat produced thereby.

One object of my invention is to provide a heater of the type referred to wherein the usual heavy clay backwall is not required.

Another object of my invention is to provide a structure that is of simple form, and of much lighter weight than various types of heaters heretofore employed.

Still another object of my invention is to provide a heater of generally simplified and improved form.

As shown in the accompanying drawings, Figure 1 is a face view of the heater with some of the elements removed; Fig. 2 is an end elevational view thereof; Fig. 3 is a sectional plan view of the heater; Fig. 4 is a view, on an enlarged scale, taken on the line IV—IV of Fig. 1, and Fig. 5 shows a modification.

The heater comprises a metal frame for supporting the burner and the clay tubes or radiants and the artificial fuel, and includes a metal base plate 6 to the rear corners of which legs 7 are secured by bolts or screws extending vertically through the corners of the base plate into the legs. The base plate at its forward edge has depending lugs 8 through which bolts 9 extend for the purpose of retaining a hearth plate or face plate 10 in place.

Front legs 11 are secured to the hearth plate 10 by means of bolts or screws 12, these legs being provided with ribbed or shouldered portions 13 which abut against the bottom edge of the hearth plate, and the legs are thereby held against pivotal or swinging movement about their attaching bolts 12.

A burner 14 is secured at its ends to the base plate by means of screws 15. Gas is supplied to the burner from a suitable source through a valve 16, and the burner is provided with a series of burner openings 17 which are disposed opposite to an elongated cut-out portion in the base plate 6, as shown more clearly in Fig. 3.

End plates 18 are secured to the base plate by means of bolts 19 which extend through horizontally-extending ears formed on the bottom edges of the end plates. The forward and upper edges of the end plates are bent outwardly to form flanges 21 for the purpose of improving the appearance of the structure, these flanges being also utilized for supporting retaining bars 22 and 23 that are bolted to the flanges.

A back plate 24 is secured to the end plates by means of bolts which extend through perforated ears 25 on the upper rear corners of the end plates 18. The back plate 24 is of short height relative to the end plates, leaving a large open space between the end plates, as shown more clearly in Figs. 2 and 4.

An intermediate back plate or partition plate 27 of sheet metal or other suitable material, is disposed between the end plates, and has its bottom edge flanged as shown at 28, whereby it is attached to the bottom plate 6 by suitable bolts. The plate 27 is recessed or stepped as shown at 29, for the reception of refractory clay blocks 31, and at its upper edge, the plate is cut out as indicated at 32, to leave passage space between it and the upper backplate 24 for heated air, which will circulate upwardly along the rear face of the plate 27 and pass through the opening at 32. There is therefore less tendency for the plate 27 to become overheated, and the use of a heavy metal plate, or a refractory back wall is therefore not necessary.

Radiant or burner tubes 34, preferably of clay, and formed on their faces with protuberances 35 that simulate fuel such as coal are supported at their lower ends between ribs 37 that are formed on the base plate 6 adjacent to the elongated burner opening through the said plate. The tubes 34 have openings in their front walls between the fuel-like protuberant portions 35, and are provided on their front and rear walls with teat-like projections 36 which become highly heated and facilitate combustion of the fuel and radiation of heat.

The burner tubes 34 are disposed mainly in straight lines and at their upper ends are bevelled. The clay blocks 31 seat at their

forward edges against the rear bevelled walls of the tubes, and loose lumps 38 of clay or other material simulating fuel are placed against the upper ends of the tubes 34, and distributed over the blocks 31, and the rear shelf-like portion of the plate 27.

The blocks 31 are provided with radiating projections corresponding to the projections 36 to produce a glowing effect on the lumps of fuel supported thereby. The members 31 could be made integrally with one another, but I prefer to form them in sections, because if one becomes broken, it can be replaced without the necessity of replacing the other blocks 31, and without the necessity of disturbing more than a few lumps of fuel in case the breakage occurs when the block is in use. The bar 23 supports the upper ends of the radiants 34 from tilting outwardly, and may also serve to assist in maintaining the artificial fuel 38 in place.

Referring to Fig. 5, I show a vertical tube 34*a* that corresponds to the tube 34, and an inclined tube 40 that is formed similarly to the tubes 34 and 34*a*, and constitutes a continuation of the tube 34*a*. Loose fuel 38*a* may be piled on the tubes 40 to increase the simulation of a coal fire. The tubes 40 are supported by the outer ends of the tubes 34*a* and by a sheet metal plate 27*a* which is cut away at 32*a* in a manner similar to the upper edge of the plate 27, to provide for circulation of air behind the plate 27*a*. The heater structure is otherwise substantially as in Figs. 1 to 4.

I claim as my invention:—

1. Heater structure comprising a framework having a back plate and an intermediate plate disposed between the back plate and the front side of the heater, the intermediate plate extending from one end of the heater, the intermediate plate extending from one end of the heater toward the other end adjacent to the longitudinal medial line thereof, and extending upwardly and rearwardly to the back plate, a burner disposed forwardly of the intermediate plate, and radiating elements disposed above the burner and in proximity to the forward side and top sides of the intermediate plate, a passageway for air being provided between the uppermost edge of the intermediate plate and the back plate, and the space below the bottom edge of the back plate, being unobstructed to permit circulation of air upwardly along the rear face of the intermediate plate.

2. A gas heater comprising a framework having a base plate, end walls, a back plate, an intermediate plate disposed between the end walls and extending upwardly and then rearwardly from the base plate to the back plate, burner tubes supported on the base plate at the front side of the intermediate plate, and artificial fuel elements supported on the rearwardly extending portion of the intermediate plate and against the upper ends of the said tubes.

3. A gas heater comprising a framework having a base plate, end walls, a back plate, an intermediate plate disposed between the end walls and extending upwardly and then rearwardly from the base plate to the back plate, burner tubes supported on the base plate at the front side of the intermediate plate, radiant blocks supported upon the rearwardly extending portion of the intermediate plate with their forward edges in abutting engagement with the upper ends of the tubes, and means for directing gases of combustion from said tubes across said blocks.

4. A gas heater comprising a framework having a base plate, end walls, a back plate, an intermediate plate disposed between the end walls and extending upwardly and then rearwardly from the base plate to the back plate, a burner tube supported on the base plate at the front side of the intermediate plate, a radiant block supported upon the rearwardly-extending portion of the intermediate plate with its forward edge in abutting engagement with the upper end of the tube, and means for directing gases of combustion from said tube across said block.

5. A gas heater comprising a framework having an intermediate plate located between the front and rear sides of the framework, the said plate extending upwardly and then rearwardly, the forward part of the rearwardly-extending portion being offset downwardly for the reception of a radiant block with its upper surface in substantial alinement with the rear portion of the plate, and a burner tube disposed below the forward edge of said block, the block and the upper rear portion of the plate being adapted to support artificial fuel.

6. A gas heater comprising a framework having an intermediate plate located between the front and rear sides of the framework, the said plate extending upwardly and then rearwardly, the forward part of the rearwardly-extending portion being offset downwardly for the reception of a radiant block with its upper surface in substantial alinement with the rear portion of the plate, a burner tube disposed below the forward edge of said block, the block and the upper portion of the plate being adapted to support artificial fuel, and means for permitting circulation of air through the framework and upwardly along the rear side of the said intermediate plate.

In testimony whereof I, the said GEORGE H. MCFADDEN have hereunto set my hand.

GEORGE H. McFADDEN.