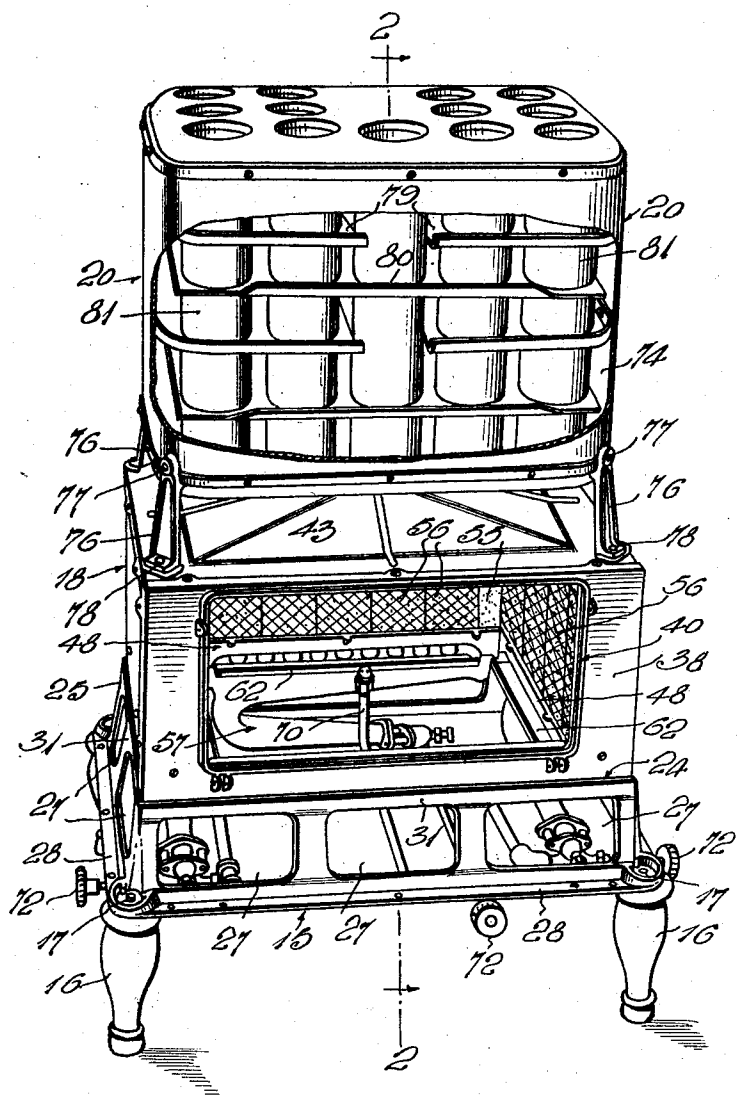
May 26, 1931. H. H. SANFORD 1,807,014

CABINET GAS HEATER

Filed June 23, 1930 7 Sheets-Sheet 1

FIG. 1



Witness
H. Woodard

Inventor
H. H. Sanford

By Howson & Howson
Attorneys

May 26, 1931. H. H. SANFORD 1,807,014

CABINET GAS HEATER

Filed June 23, 1930 7 Sheets-Sheet 2

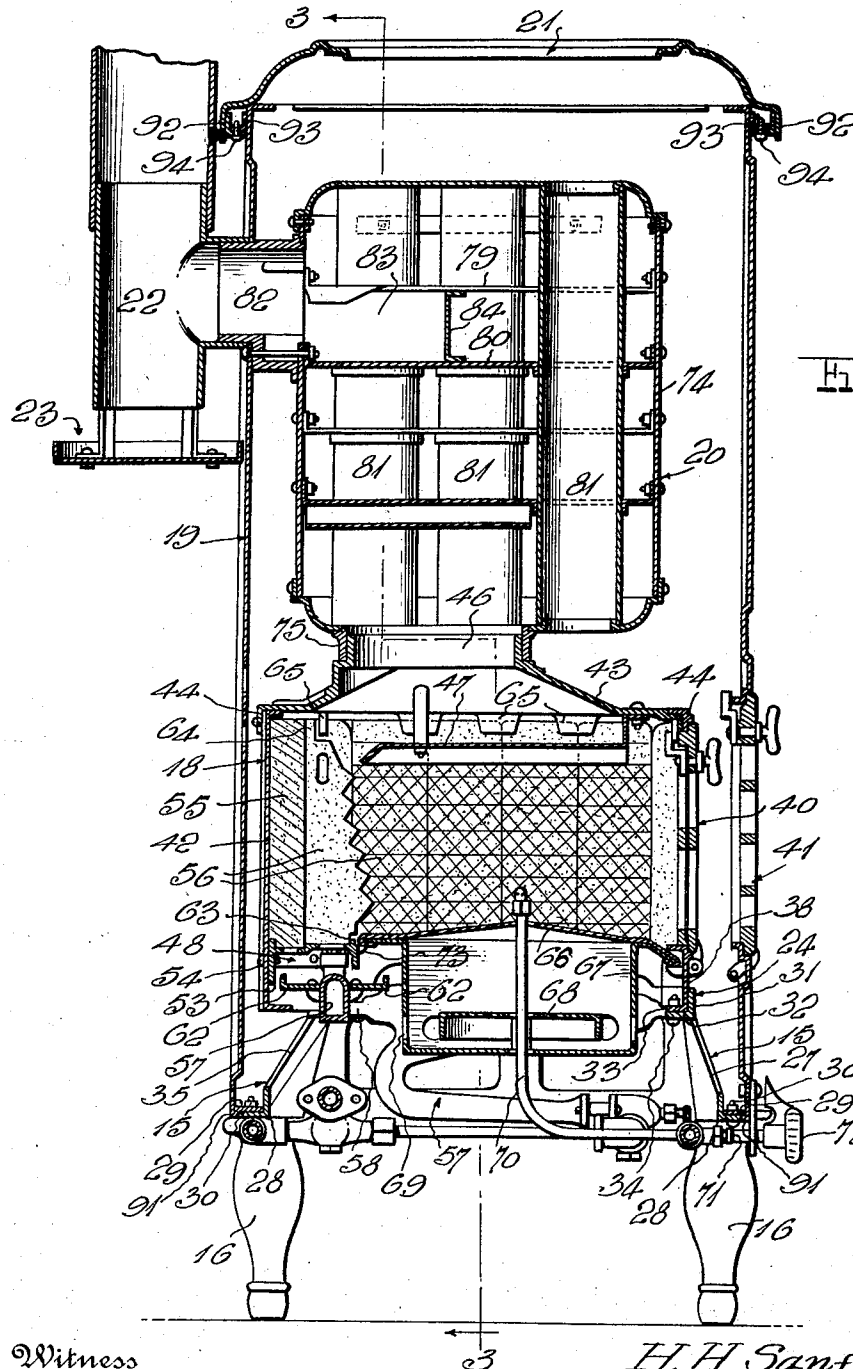


FIG. 2.

Witness
H. Woodard

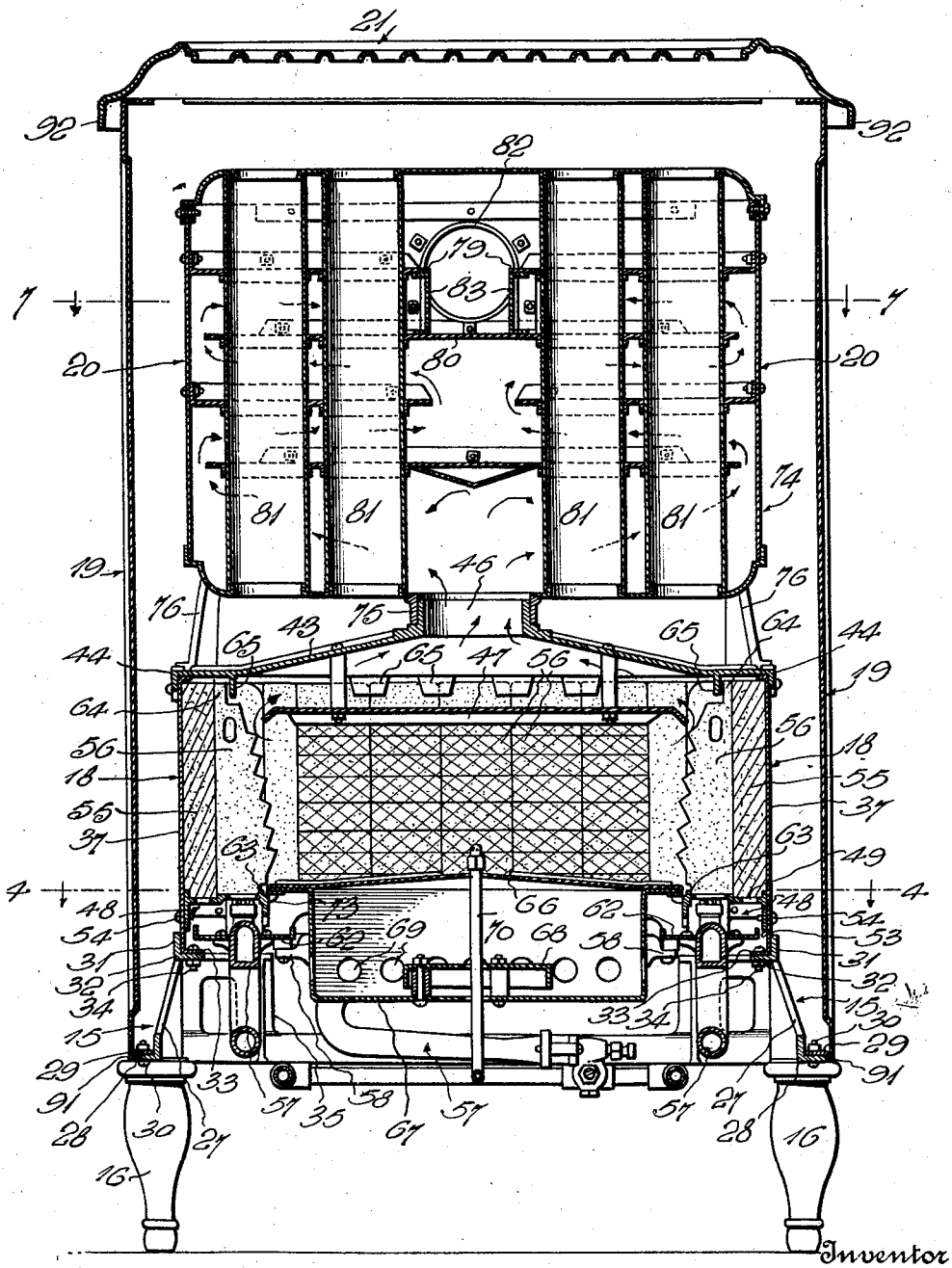
Inventor
H. H. Sanford

By H. B. Williamson & Co
Attorneys

May 26, 1931. H. H. SANFORD 1,807,014

CABINET GAS HEATER

Filed June 23, 1930 7 Sheets-Sheet 3



Witness
H. Woodard

Inventor
H. H. Sanford

By H. B. Williamson & Co
Attorneys

May 26, 1931. H. H. SANFORD 1,807,014

CABINET GAS HEATER

Filed June 23, 1930 7 Sheets-Sheet 4

FIG. 4.

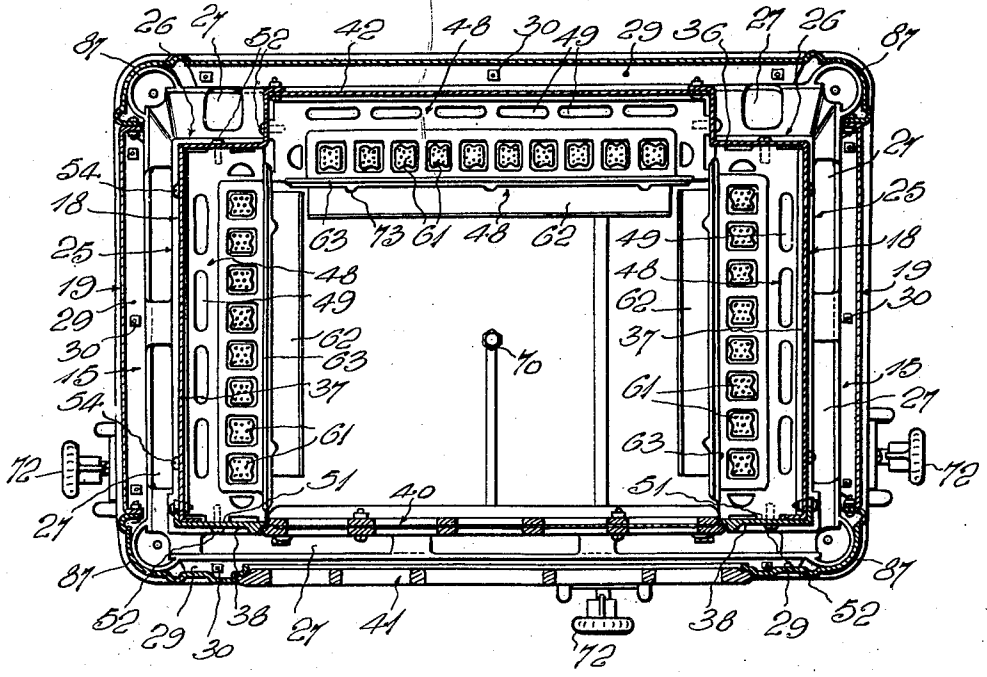


FIG. 5.

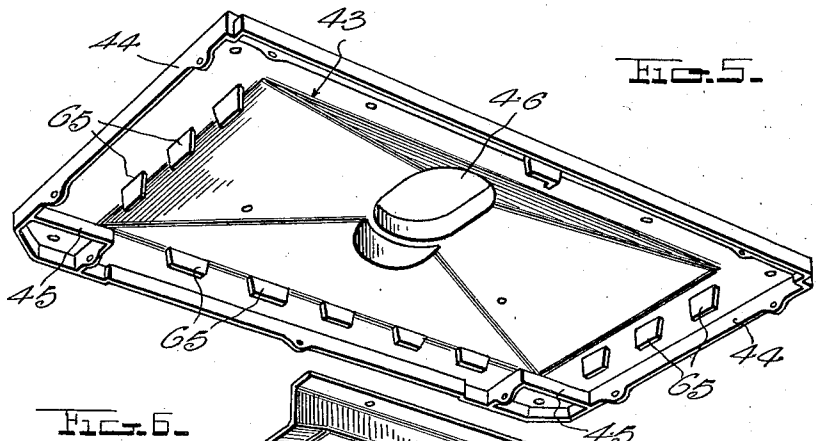
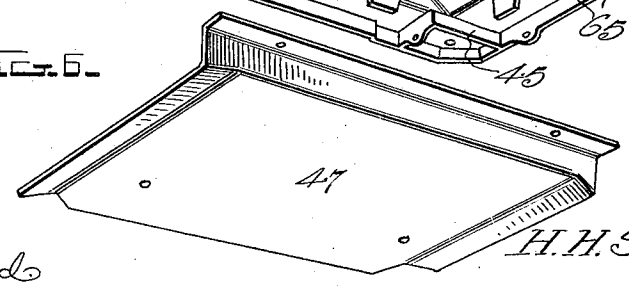


FIG. 6.



Witness
H. Woodard

Inventor
H. H. Sanford

By Williamson & Co
Attorneys

May 26, 1931. H. H. SANFORD 1,807,014

CABINET GAS HEATER

Filed June 23, 1930 7 Sheets-Sheet 5

FIG. 7.

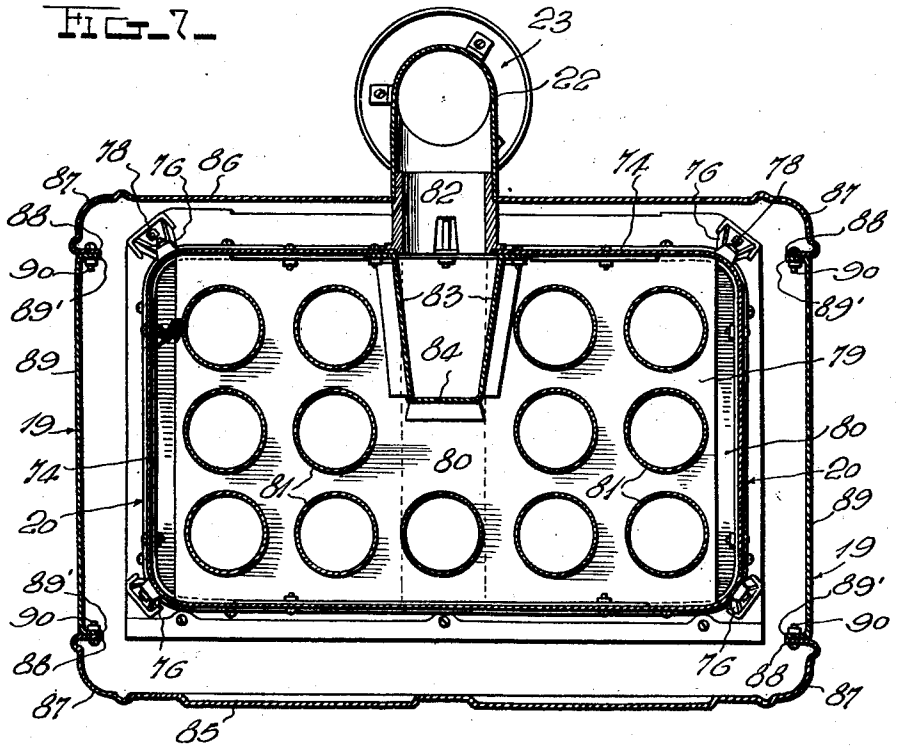
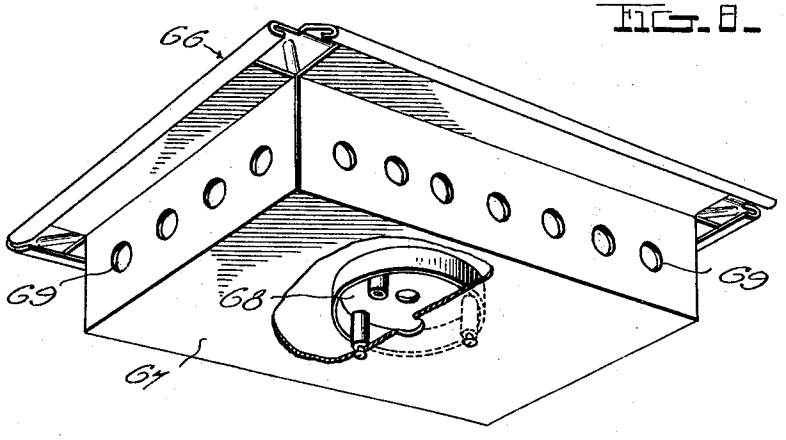


FIG. 8.



Witness
H. Woodard

Inventor
H.H. Sanford

By H. B. Williamson & Co
Attorneys

May 26, 1931. H. H. SANFORD 1,807,014

CABINET GAS HEATER

Filed June 23, 1930 7 Sheets-Sheet 6

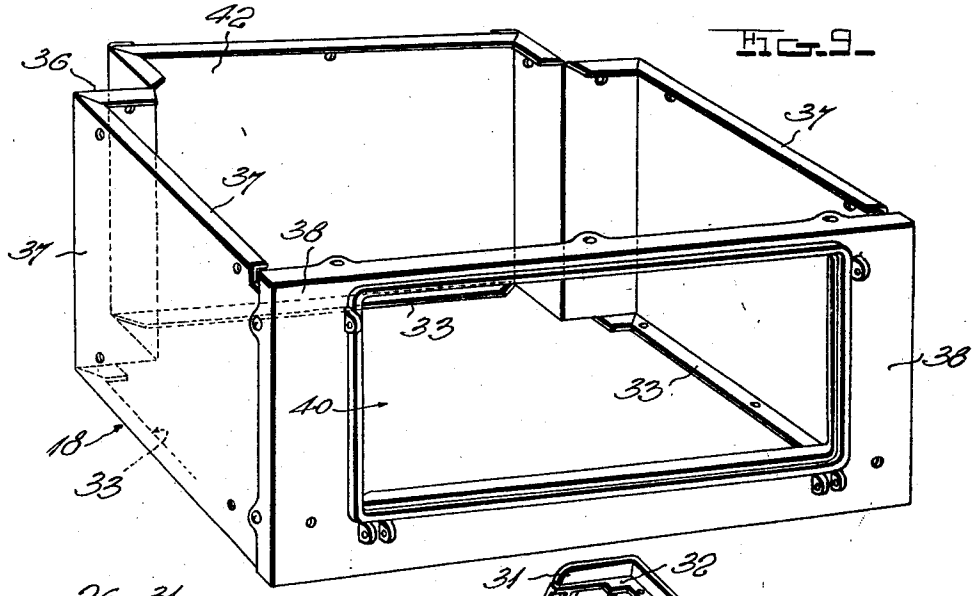


Fig. 9.

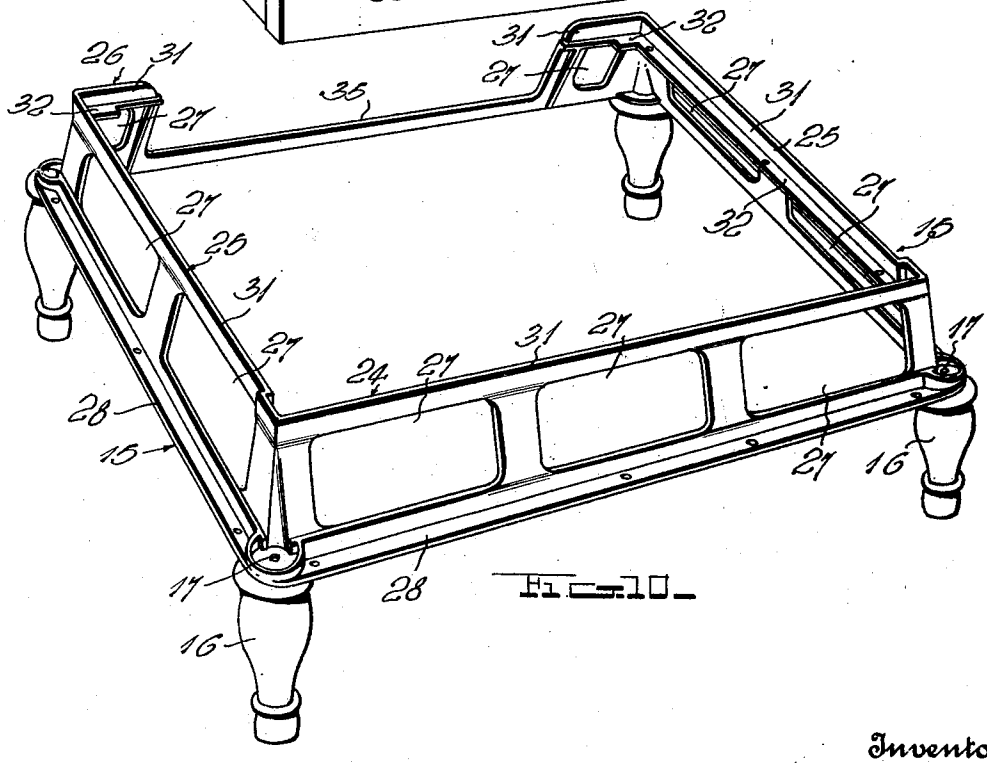


Fig. 10.

Witness
H. Woodard

Inventor
H. H. Sanford

By H. B. Williamson & Co
Attorneys

May 26, 1931. H. H. SANFORD 1,807,014

CABINET GAS HEATER

Filed June 23, 1930 7 Sheets-Sheet 7

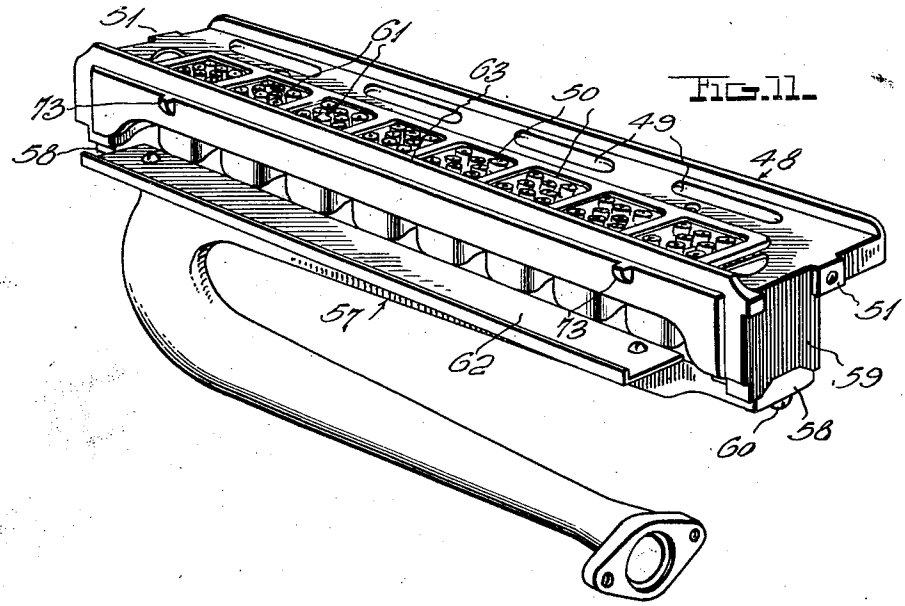


Fig. 11.

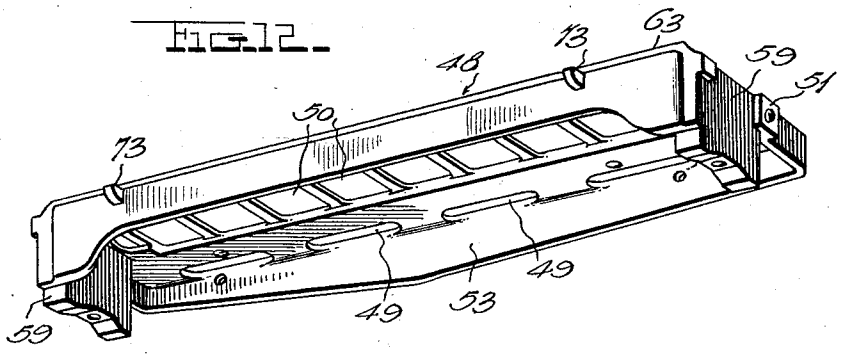


Fig. 12.

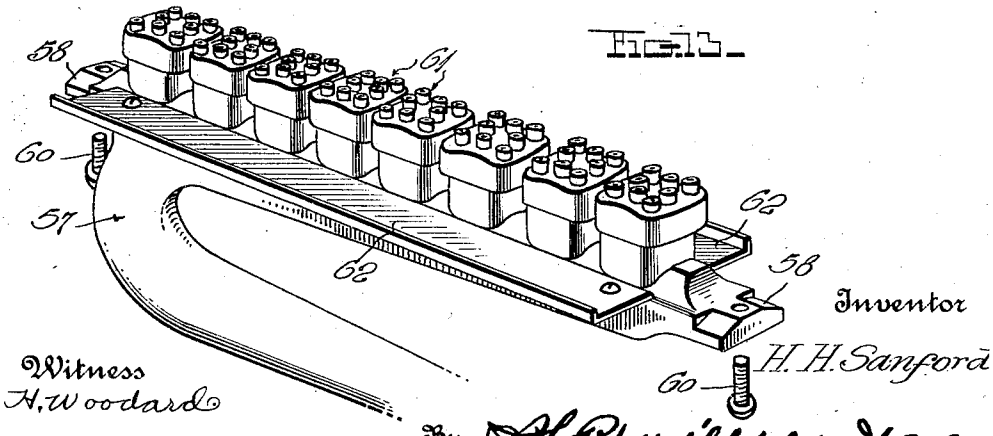


Fig. 13.

Witness
H. Woodard

Inventor
H. H. Sanford

By A. B. Williamson & Co
Attorneys

Patented May 26, 1931 1,807,014

UNITED STATES PATENT OFFICE

HENRY H. SANFORD, OF MANSFIELD, OHIO

CABINET GAS HEATER

Application filed June 23, 1930. Serial No. 463,189.

The invention aims primarily to provide a new and improved radiant gas heater of a cabinet type, capable of heating a number of rooms.

In carrying out the above end, a further object is to provide for the effective heating of air without bringing it into contact with the flame from the burner or burners, provision being made whereby this air ascends within an outer casing through open-work side members of a base frame, passes around an inner casing containing the heating means, ascends through an air-heating drum mounted on said inner casing, and discharges from the upper end of said outer casing.

Still further objects are to provide a base of novel construction to support both the inner and the outer casings; to provide fire-backs and radiants at the rear and opposed sides of the inner casing and to provide registering doors in the fronts of the inner and outer casings giving access to the radiants; to provide unique supports for the fire-backs, radiants and burners; to provide a novel air-cooled bottom for the inner casing to prevent dangerous downward radiation of heat; to provide an air-heating drum of unique and advantageous construction; to provide an outer casing which may be assembled without any bolt heads or the like being visible; and to provide for a generally simple and efficient construction which may be expeditiously manufactured and marketed.

With the foregoing in view, the invention resides in the novel subject matter hereinafter described and claimed, description being accomplished by reference to the accompanying drawings.

Fig. 1 is a perspective view partly broken away and in section, the outer casing being removed.

Fig. 2 is a vertical sectional view through the complete heater taken on line 2—2 of Fig. 1.

Fig. 3 is a vertical sectional view at right angles to Fig. 2, taken on line 3—3 of the latter.

Fig. 4 is a horizontal sectional view on line 4—4 of Fig. 3.

Fig. 5 is a perspective view of the top of the inner casing or combustion chamber.

Fig. 6 is a perspective view of the baffle plate carried by the casing top shown in Fig. 5.

Fig. 7 is a horizontal sectional view on line 7—7 of Fig. 3.

Fig. 8 is a perspective view partly broken away and in section, illustrating the air-cooled bottom for the inner casing or combustion chamber.

Fig. 9 is a perspective view showing the front, back and sides of the inner casing connected with each other.

Fig. 10 is a perspective view of the supporting base.

Fig. 11 is a perspective view showing one of the burners and the overlying support for fire-back and radiants.

Figs. 12 and 13 show the burner and the support in juxtaposition.

In the drawings above briefly described, a construction has been illustrated which has proven of advantage from standpoints of manufacture, sale and use, and while said construction will be herein specifically explained, it is to be understood that within the scope of the invention as claimed, variations may be made. Moreover, while the invention relates primarily to a gas heater, it will be understood to those skilled in the art, that a number of features of novelty hereinafter described, may be used regardless of the kind of fuel which may be employed.

The numeral 15 denotes a rectangular base supported on legs 16, said legs preferably having threaded studs 17 detachably engaged with openings in the corners of said base. An inner rectangular casing 18 and a relatively large outer casing 19, are both supported by the base 15, and an air-heating drum 20 is supported by the casing 18 and embodies passages for circulation of air being heated and for travel of the products of combustion ascending from the casing 18. The heated air escapes through a grille-work 21 at the upper end of the casing 19, and the products of combustion escape from the drum 20 through a suitable vent device 22, said device preferably embodying an air inlet 23

through which some air may escape from the room, so that the escaping air will be replaced by fresh air entering from the outside.

The base 15 embodies side members 24, 25 and 26 all disposed horizontally and vertically widened, said side members being of openwork form to permit passage of air through their openings 27. The base 15 gradually diminishes in horizontal extent from its lower to its upper portion, so that said lower portion may support the outer casing 19 and said upper portion may support the inner casing 18, the two casings being spaced apart. The lower edges of the side members 24, 25 and 26 are provided with outwardly projecting flanges 28 upon which inturned flanges 29 of the casing 19, are secured by bolts 30. The upper edge portions of the side members 24, 25 and 26 are provided with strictly vertical portions 31 which embrace the lower portion of the inner casing 18 and at the lower extremities of said vertical portions 31, said side members are provided with inwardly projecting ledges or flanges 32 upon which inturned flanges 33 of the casing 18, are secured by bolts 34. The rear side member 26 is provided substantially throughout its length with a notch 35 which opens through its upper edge as shown most clearly in Fig. 10, said notch being provided for a purpose to appear.

The back 36 and opposed sides 37 of the casing 18, are preferably formed from sheet metal while the front 38 of said casing is preferably a casting provided with an appropriate door 40 which registers with a door 41 in the outer casing 19. The back wall 36 is provided with a rearward offset 42 which is received in the notch 35 of the base 15. The top 43 of the casing 18 is preferably a casting, being flanged at 44 and 45 for engagement with the casing sides and being secured to the latter by bolts or the like. This top 43 is of dome-like form and is provided at its highest point with an outlet collar 46 for products of combustion. Suitably connected with and spaced downwardly from top 43, directly under the collar 46, is a suitable baffle 47 which prevents the products of combustion from short-circuiting to said collar and hence insures higher heating of the casing 18.

Secured against the inner sides of the opposed casing walls 37 and in the offset 42, are horizontal fire-back and radiant supports 48. The location of these supports is seen in Figs. 2, 3 and 4 and their construction is most clearly illustrated in Figs. 11 and 12. Each support 48 is in the form of a casting whose fire-back supporting portion is preferably slotted at 49 for lightness and to prevent overheating, the radiant supporting portion of said support being provided with a plurality of openings 50. The ends of the support 48 are provided with flat vertical surfaces 51 to abut portions of the casing 18 as seen in Fig. 4, being secured against said casing portions by screws 52. The outer longitudinal edge of the support 48 is provided with a downwardly projecting flange 53. These flanges of the three supports are secured against the casing sides by screws 54. These screws and the screws 52 securely mount the supports 48 and these supports not only carry the fire-backs 55 and the radiants 56, but they also support the burners 57. The ends of the burners 57 are provided with projecting lugs 58 whose upper surfaces are preferably crowned as shown in Fig. 13, and the ends of the supports 48 are provided with downwardly projecting lugs 59 shaped to engage said crowned upper sides of said lugs 58, the burner lugs being secured to the support lugs by screws 60.

Except for the lugs 58, the burners 57 are of known form, being provided with spaced groups of orifices 61 for upwardly directing flame through the openings 50 into the radiants 56. Along its inner and outer sides, each burner 57 is preferably provided with shallow pans 62 which catch any small fragments which may possibly fall from the fire-backs or radiants, preventing them from reaching the floor with danger of fire.

The radiants 59 are of course readily replaceable, their lower ends being seated upon the supports 48 behind ribs 63 thereof, while the upper ends of said radiants are provided with upstanding lugs 64 seated behind lugs 65 which are integral with and project downwardly from the casing top 43. By raising any radiant sufficiently to clear the rib 63, its lower end may be pulled inwardly and its lug 64 disengaged from the lug 65, insertion of a new radiant being possible by a reversal of these operations.

An air-cooled bottom is provided for the casing 18, said bottom comprising a top plate 66, a pan-like box 67 secured at its upper edge to said top plate, and a baffle 68 suitably mounted in said box, the side wall of the latter being provided with air openings 69. The burners possess a capacity of 70,000 B. t. u., producing such an intense and large volume of heat in the combustion chamber that the baffle 68 is necessary to protect the floor upon which the heater rests, even though the combustion chamber bottom be of air-cooled form. A pilot burner 70 rises through openings in the top plate 66, the baffle 68 and the pan bottom, and is controlled by a valve 71. Other valves 72 are of course provided for the burners 57. When desirable for any purpose, the entire hollow bottom may be upwardly withdrawn from the pilot 70 and removed through the doors 40 and 41, for said bottom is not secured in place, being merely rested upon lugs 73 which project inwardly from the supports 48.

The air heating drum 20 embodies a substantially rectangular casing 74 whose bot-

tom is provided with a collar 75 telescoped with the collar 46 of the casing top 43. The corners of the casing 74 are provided with legs 76, the upper ends of said legs being secured at 77 to the casing while the lower ends of said legs are provided with feet bolted at 78 to the casing top 43.

Within the casing 74 is a series of horizontally disposed vertically spaced baffles which define a tortuous course for the products of combustion as indicated by the arrows in the drawings. As the arrangement of these baffles is clear without specific explanation, only those with which special features of construction are related, will be identified by reference characters, 79 and 80 being used for this purpose. Through all of the baffles, vertical air-conducting tubes 81 pass, said tubes being open at their upper and lower ends, so that as the products of combustion are "zig-zagging" through the drum 20, air ascending through the tubes 81 will be effectively heated. The products of combustion escape to the vent device 42, by way of a collar 82 which is secured to the upper rear portion of the casing 74 and passes rearwardly through an opening in the outer casing 19. Collar 82 is positioned with respect to the baffles 79 and 80, in the manner illustrated in Figs. 2, 3 and 7.

The two baffles 79 extend inwardly from opposite sides of the casing 74 and have their inner ends spaced apart, while the baffle 80 extends uninterruptedly from a point near one side of said casing to a point near the other side. Resting upon this baffle 80 is a vertical wall 83 which is of U-shape in plan view, the front to rear dimension of said wall being considerably less than the front to rear dimension of the casing 74, so that the bight portion 84 of said wall is rearwardly spaced to quite an extent from the front wall of said casing. The rear ends of the wall 83 are secured to the back wall of casing 74 at opposite sides of the collar 82, and the upper edges of the front to rear portions of said wall, extend along the inner ends of the baffles 79.

By providing the wall 83 related with the parts 79, 80 and 82 in the manner shown, more heating efficiency is obtained from the products of combustion before they escape. These products pass upwardly around the ends of the baffle 80, inwardly under the baffles 79, forwardly to the front end of the wall 83, then upwardly around the inner ends of the baffles 79 and finally escape through the collar 82.

The outer casing 19 is preferably of the construction shown most clearly in Figs. 2, 3 and 7. The front wall 85 and the back wall 86 both have their vertical edges curved inwardly at 87, providing rounded corners for the casing, said edges being then bent inwardly into parallel relation with said walls to provide vertical flanges 88. The opposed side walls 89 have their vertical edges bent inwardly at right angles to provide flanges 89′ which are secured by bolts 90 against the flanges 88. The lower edges of all of the walls 85, 86 and 89 are provided with the inwardly projecting flanges 29 which are secured upon the base flanges 28 and said walls are preferably provided with beads 91 which extend around the outer edges of said flanges 28 and hide the latter from view.

The grille-work top of the casing 19 is provided with a downwardly projecting peripheral flange 92 which is spaced outwardly from the side walls of the casing. These walls and flanges are provided with horizontal overlapping flanges 93 secured together by screws 94, said overlapping flanges and screws being obscured by said flanges 92.

By constructing the outer casing 19 in the manner shown and described, no fastening means are visible and hence a better appearance is given to the complete structure.

Heretofore, quite a serious objection to radiant type heaters, has been that they discharge all of the heat from the top and continually draw a large volume of cold air to the floor so that there is no way of warming the feet. With the present heater however, the hollow bottom of the combustion chamber downwardly radiates a great amount of heat, making it possible to keep the feet comfortable.

It will be seen from the foregoing that a unique and advantageous construction has been provided for carrying out the objects of the invention, and while the details disclosed are preferred, attention is again invited to the fact that within the scope of the invention as claimed, variations may be made.

What is claimed is:—

1. A cabinet gas heater comprising a rectangular combustion chamber having a discharge opening for products of combustion, an air heating drum mounted over said combustion chamber and having conducting means for the products of combustion communicating with said opening, an air conducting casing around said combustion chamber and drum, fire-backs and radiants mounted at the back and sides of said combustion chamber, registering doors in the fronts of said combustion chamber and casing, and gas burners mounted under said radiants.

2. A cabinet gas heater comprising a leg-supported base frame having side members of openwork form, said frame decreasing in horizontal extent toward its upper portion, a casing secured upon the upper portion of said frame and having a door in its front, said casing being provided with a dome-like top having an outlet collar for products of combustion, radiant heating means in said casing, an air-heating drum having a conducting passage for products of combustion and conducting tubes for the air being heat-

ed, said drum being disposed over said casing and having an inlet collar telescoped with the first named collar, and an air-heating casing supported by the lower portion of said base frame and having a door in its front registering with the first named door, said air-heating casing being spaced around the first named casing and said drum, said drum having an outlet for products of combustion extending to the exterior of said air-heating casing.

3. In a gas heater, a leg-supported base frame, embodying horizontal vertically widened side bars of openwork form, the rearmost of said bars having a horizontally elongated notch opening through its upper edge, said frame decreasing in horizontal extent toward its upper edge, a casing supported by the upper portions of said side bars, the back wall of said casing having a rearward offset received in said notch, a fire-back, radiants and a burner mounted in said offset of said back wall, additional fire-backs, radiants and burners mounted in opposed sides of said casing, and an air-conducting casing spaced around the first named casing and supported by the lower portion of said base frame.

4. In a gas heater, a casing, horizontally elongated supports secured at the back and sides of said casing and projecting inwardly therefrom, fire-backs and radiants resting on said supports, the latter having portions projecting inwardly beyond said radiants, and a casing bottom resting on said portions of said supports.

5. In a gas heater, a casing, two horizontally elongated fire-back and radiant supports extending from front to back of said casing at opposed sides of the latter and abutting the casing front and back, said casing back having a rearward offset between the inner edges of said supports, a third fire-back and radiant support snugly received in said offset, fasteners securing said supports to said casing, fire-backs and radiants resting on said supports, and burners mounted under said supports.

6. In a gas heater, a casing, two horizontally elongated fire-back and radiant supports extending from front to back of said casing at opposed sides of the latter and abutting the casing front and back, said casing back having a rearward offset between the inner edges of said supports, a third fire-back and radiant support snugly received in said offset, fasteners securing said supports to said casing, fire-backs and radiants resting on said supports, burners under said supports, and fasteners securing said burners to said supports.

7. In a gas heater, a casing having a radiant and fire-back support projecting inwardly from one of its side walls, said casing being provided with a top having a row of downwardly projecting lugs spaced inwardly from said side wall, a fire-back resting on said support, and radiants lying against said fire-back, said radiants resting on said support and having upstanding lugs lying behind the aforesaid lugs.

8. A cabinet gas heater comprising a rectangular combustion chamber having a dome-like top, a drum spaced above said dome-like top, a passage for products of combustion leading from the top of said combustion chamber into the lower end of said drum, an outlet for products of combustion leading from the upper end of said drum, a plurality of vertical air-conducting and heating tubes extending vertically through said drum, both the upper and lower ends of said tubes being open and said lower ends being in communication with the space between said combustion chamber and drum, an air conducting casing spaced around said combustion chamber and drum, three fire-backs mounted at the back and two adjacent sides of said combustion chamber respectively, radiants lying against all of said fire-backs, and burners under said radiants.

In testimony whereof I affix my signature.

HENRY H. SANFORD.