H. A. MUSSER.

HEATER.

APPLICATION FILED JULY 11, 1917.

1,280,071.

Patented Sept. 24, 1918.

3 SHEETS—SHEET 1.

Fig. 1.

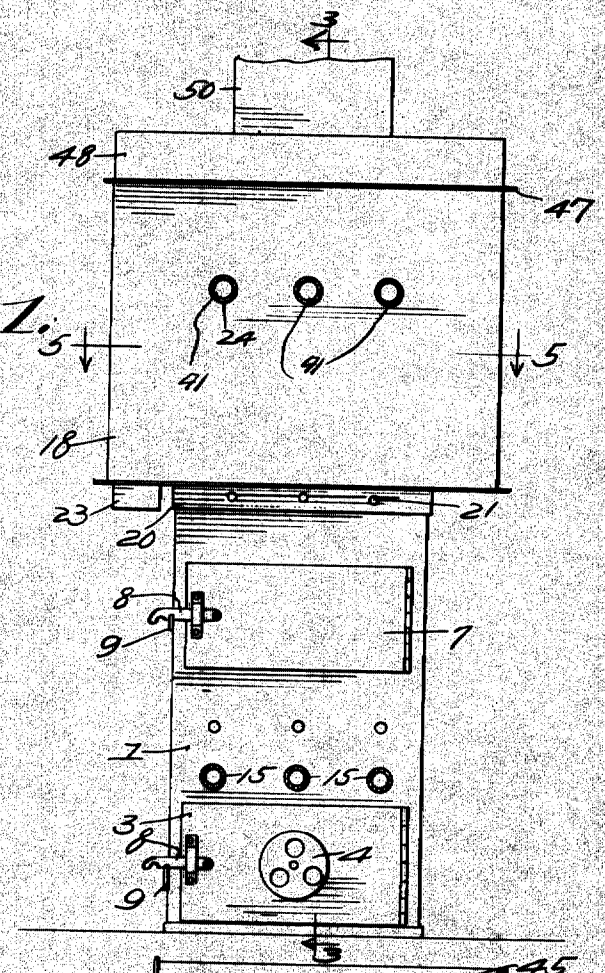
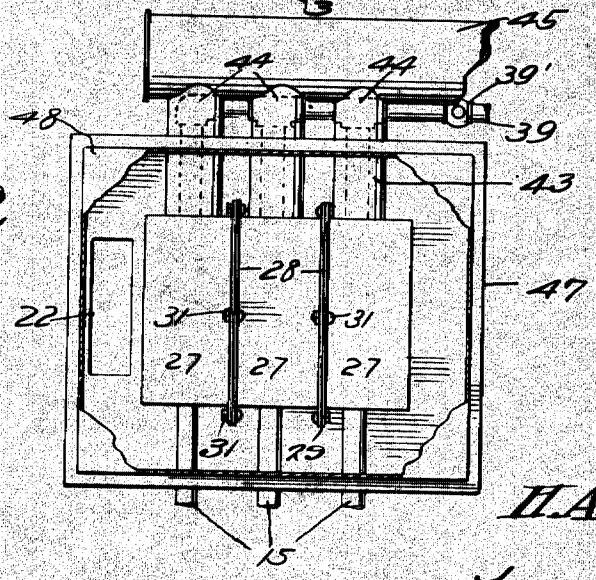


Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 3.

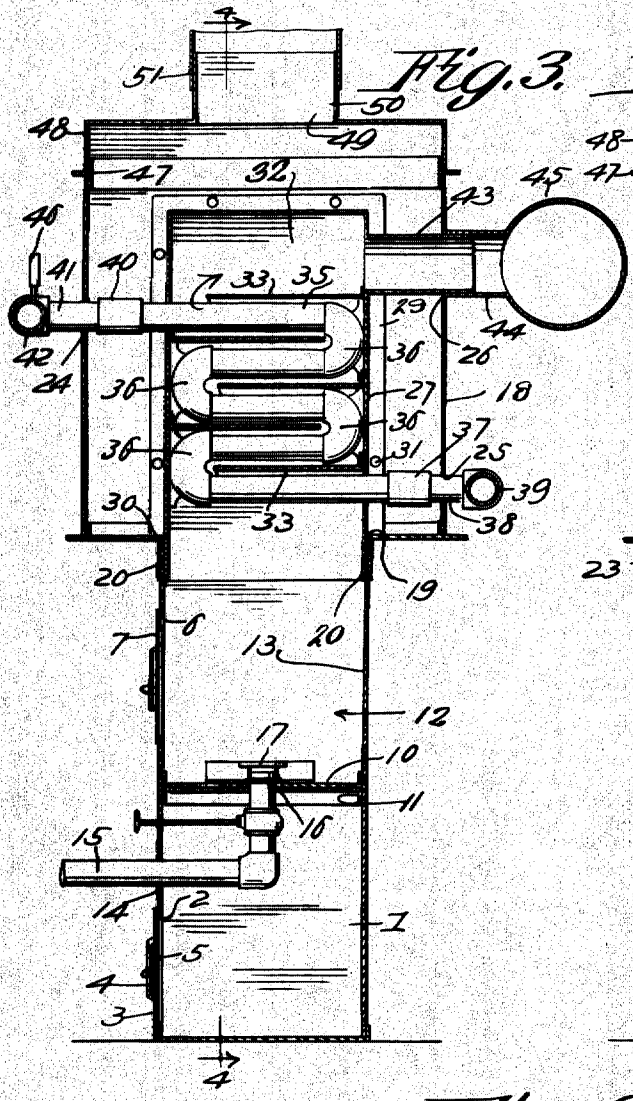


Fig. 4.

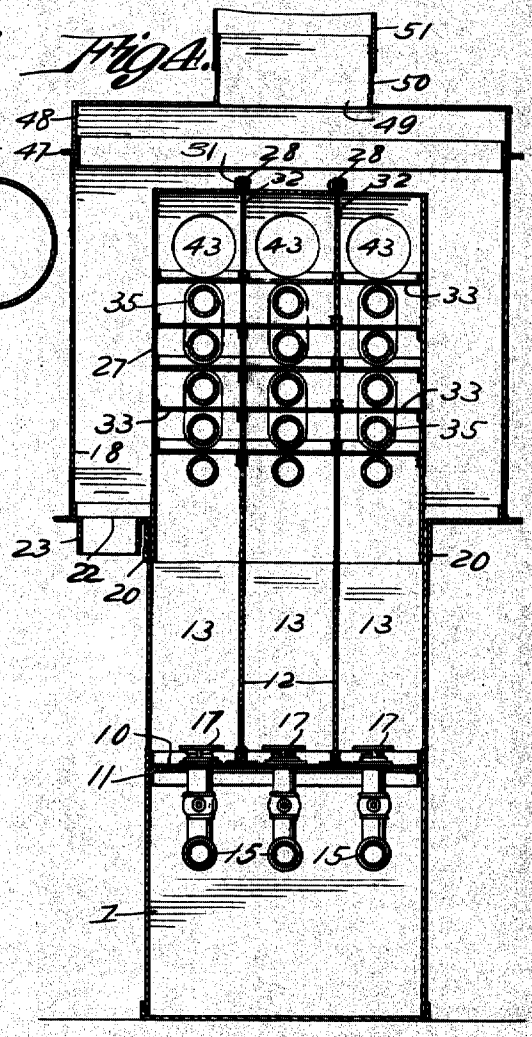
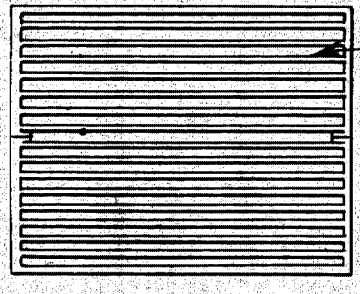


Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 5.

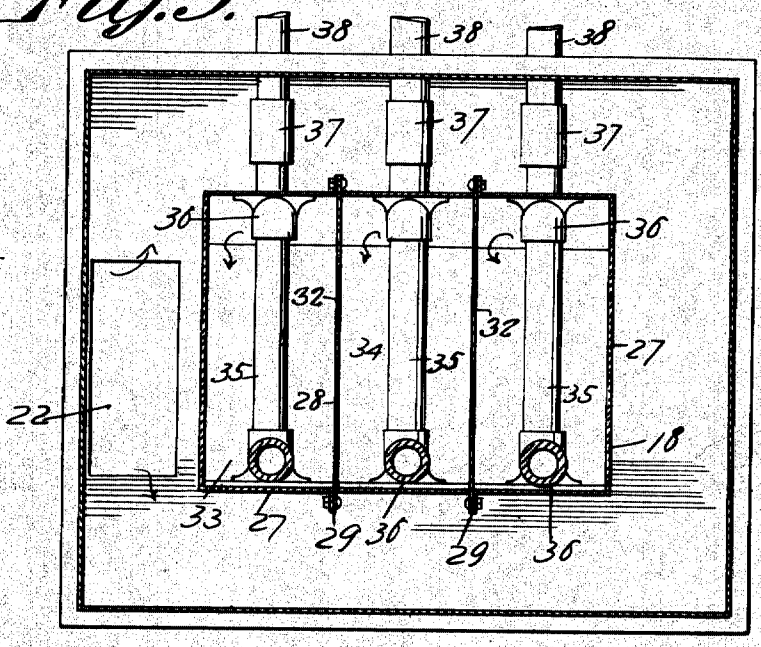


Fig. 6.

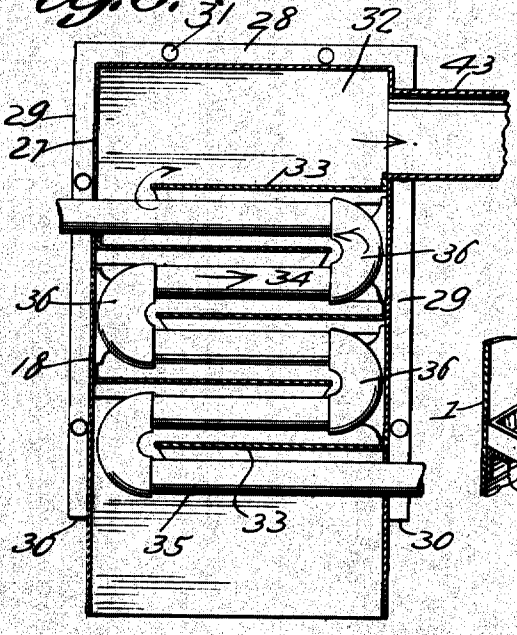
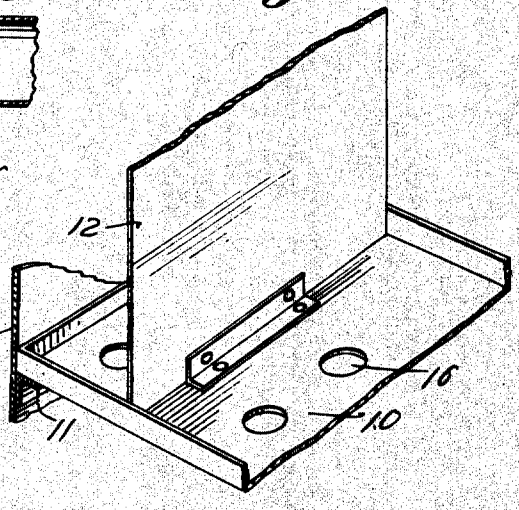


Fig. 7.



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UNITED STATES PATENT OFFICE.

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HEATER.

1,280,071. Specification of Letters Patent. Patented Sept. 24, 1918.

Application filed July 11, 1917. Serial No. 179,931.

To all whom it may concern:

Be it known that I, HARRY A. MUSSER, a citizen of the United States, residing at Lexington, in the county of Fayette and State of Kentucky, have invented certain useful Improvements in Heaters, of which the following is a specification, reference being had therein to the accompanying drawing.

The present invention has reference generally to heaters and more particularly relates to a combined air and water heater.

The primary aim and object of the present invention contemplates the provision of a combined air and water heater for use in a house or other building embodying novel means whereby the water in the pipes leading to the various rooms in the building may be separately heated, thus providing an economical method of heating a building as it is unnecessary to heat the whole boiler as is the case in heating devices at present in use.

It is an additional and equally important object of this invention to provide a sectional heating chamber, the sections of which are arranged so that the water pipes passing therethrough may be independently heated.

This invention also contemplates the provision of an air jacket about the sectional heating chamber, means being provided to permit of the entrance of cold air into the jacket so that it may be heated as it circulates therethrough, the heated air serving incidentally to maintain the water in the pipes in the other sections warm so that it may be quickly heated when it is desired to heat the room or rooms to which the hot water conducting pipes may lead.

More particularly, the present invention contemplates the provision of novel means for supporting the heating agent, said means being constructed to form heat passages which communicate with the independent sections of the heating chamber.

It is a more specific object of this invention to provide novel means for conveying the burnt gases from the heating chamber; to provide novel means for supporting the heating chamber on the base section above the heating agent and to provide improved means for connecting the inlet and outlet water pipes to the water pipes in the several sections of the heating chamber.

Among the other aims and objects of the present invention may be recited the provision of a device of the character mentioned with a view to compactness, and in which the number of parts are few, the construction simple, the cost of production low and the efficiency high.

Other objects as well as the nature, characteristic features and scope of this invention will be more readily apparent from the following description taken in connection with the accompanying drawings and pointed out in the claims, forming a part of this specification.

The invention is clearly illustrated in the accompanying drawings in which:—

Figure 1 is a front elevation of the invention.

Fig. 2 is a top plan view with the cover partly broken away showing the body forming the jacket.

Fig. 3 is a transverse section taken on line 3—3 of Fig. 1.

Fig. 4 is a vertical section taken on line 4—4 of Fig. 3.

Fig. 5 is an enlarged horizontal section taken on line 5—5 of Fig. 1.

Fig. 6 is a detail of one of the sections of the heating chamber.

Fig. 7 is a detail of the supports for the gas pipes forming the heating agent, and

Fig. 8 is a detail of a grate employed when coal is used as a heating agent.

Similar characters of reference are employed in all of the above described views, to indicate corresponding parts.

Referring now, more particularly, to the accompanying drawings I provide a base section 1 with a door opening 2 in the front wall thereof adjacent the bottom, said opening being closed by a door 3 hinged to one end thereof. By the provision of the door and opening, entrance may be readily had to the pit provided at the bottom of the base section. The door has a circular perforated draft controlling door 4 rotatably mounted thereon which coöperates with the perforations 5 in the door. The front wall is also provided with another door opening 6 adjacent the upper edge which is closed by another door 7 hinged adjacent one end of the opening. Both of the doors 3 and 7 are held in a closed position by means of pivoted latch bars 8 which engage the stationary catches 9 carried by the side walls of the body. The door 7 allows access to the support for the heating agent which

in the present instance is in the form of a horizontal partition 10 supported on flanges 11 carried by opposite walls of the body. Vertical partitions 12 are arranged in spaced relation on the partition 10 and extend transversely of the base section providing heat passages 13 between the partitions 12 for a purpose that will presently appear. The front wall of the base section between the door openings is provided with a series of horizontally arranged base openings 14 for receiving gas inlet pipes 15 the inner ends of which are arranged through the openings 16 in the partition 10. Burners 17 manually controlled are mounted on the inner ends of the pipes 15, one being arranged in each heat passage 13.

Mounted on the upper end of the base section is the body 18 provided with an opening 19 in the bottom from which depends a flange 20 which is arranged in telescoped relation with the upper edge of the base and secured thereto by suitable fasteners 21. The bottom of the body is also provided with another opening 22 which permits of cold air to pass into the body, a flange 23 depends from the opening exteriorly of the base section and serves as a means whereby a cold air inlet pipe (not shown) may be connected thereto. The body is also provided with a plurality of uniformly spaced horizontally arranged openings 24 in the front wall thereof and with a series of correspondingly formed openings 25 in the rear wall adjacent the lower edge thereof and still further provided with a horizontally arranged series of openings 26 in the rear wall adjacent the upper edges, these openings 26 being provided for a purpose that will presently appear.

With a view toward providing the novel heating chamber hereinbefore mentioned, I have provided a plurality of rectangular casings 27 each of which have one side and bottom open or removed while a flange 28 extends from the upper edge and flanges 29 extend from the side edges and terminate short of the lower edge to provide shoulders 30. The intermediate section has its flanges secured to the corresponding flanges on the adjacent end sections by means of nut and bolt arrangements 31. The intermediate section also carries rectangular plates 32 to which is bolted the flanges of the main section in a manner similar to which the flanges of the other two sections are secured. Subsequent to the securing of the sections in this manner the lower ends are arranged transversely of the upper edge of the base section and supported therein through the medium of the shoulders 30 so that the sections 36 form passages which are arranged in communication with the heat passages 13. Although there are only three sections shown, obviously any number of these sections may be provided so as to correspond to the number of rooms in the building. Each section carries on the inner face of its side walls superimposed baffles 33. Upon reference to Fig. 6 it will be noted that the baffles are carried upon or cast integral with the oppositely disposed end walls and are arranged longitudinally with respect to each other so as to consequently provide a sinuated flue 34. Arranged in this flue is the sinuated sectional water pipe 35 certain elbow sections 36 of which are rigidly connected to the adjacent end wall while the inlet end of the pipe projects through the end wall adjacent the lower edge and has a threaded sleeve 37 mounted thereon. Each threaded sleeve 37 receives one of the threaded nipples 38 the latter in turn having their opposite ends connected to the water inlet pipe 39. A valve 39′ may be arranged in the pipe 39 to control the flow of water therethrough. The upper or outlet ends of the pipes 35 extend from the opposite end wall of each section while threaded sleeves 40 are mounted therein. The outer ends of the sleeves are adjustably engaged on one end of the threaded nipples 41 which are mounted in the openings 24 in the front wall of the body and have their outer ends connected to a hot water conducting pipe 42. In order to conduct the burnt gases from each of the sections, tubes 43 extend from the rear end wall and pass through the openings 26 in the rear wall of the body 18 being engaged by the sleeve projections 44 integrally formed with the smoke conducting pipe 45 which leads to the chimney. A thermometer 46 may be mounted on each water pipe 42 so that the attendant may observe the temperature of the water flowing therethrough.

In order to inclose the body which forms the hot air jacket about the sectional heating chamber I have removably arranged a flanged ring 47 about the upper edge of the body and removably fitted thereon a flanged cover 48 having an opening 49 therein about which is formed an upstanding flange 50 for receiving a hot air outlet pipe 51. If desired this pipe may be arranged so that the branches may lead to the various rooms in the building to assist the hot water pipes in heating the rooms.

In Fig. 8 I have disclosed a modified form of grate 54 which may be employed instead of the partition 10 so as to support the coal or other similar fuel which may serve as the heating agent. When coal is employed, as intimated the bottom of the base section serves as an ash pit while the door 3 may be opened to enable the attendant to remove the ashes therefrom.

The operation of the invention may be reviewed as follows: Assuming that the parts

have been assembled in the manner described and it is desired to heat the water in the pipes in all of the sections, the door 7 is opened and the burners 17 lighted. This door of course may be closed and the circular draft controlling door 4 may now be adjusted. The flames will pass through the heat passages 13 between the partitions 12 and enter the corresponding sections 27 of the heating chamber arranged thereabove. The heat now passes through the sinuated heat passages or flues 34 in the sections provided by the baffles 32 and in which are arranged the sinuated pipe sections 35 and consequently the water which flows through the pipes 35 is heated and thence passes through the hot water conducting pipe 42. The burnt gases in the sections pass through the tubes 43 and finally enter the smoke conducting pipe 45 which is in communication with the chamber so that these gases are thus conveyed to a point remote from the heater and obviate any odor in any part of the building. During this operation the sections of the heating chamber which are preferably formed of cast iron are heated so as to consequently heat the air which enters the bottom of the body forming the air jacket. As the air circulates through the jacket it is heated owing to its contact with the chamber sections and finally passes through the outlet opening in the top of the cover from which point it may be conducted to the rooms in the building and thus coöperate with the hot water pipes in heating the rooms.

It will be understood that the above description and accompanying drawings comprehend only the general and preferred embodiment of my invention and that various minor changes in detail of construction, proportion and arrangement of the parts may be made within the scope of the appended claims and without sacrificing any of the advantages of my invention.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A heater of the character described including a base section, heating means arranged in the section, a sectional heating chamber arranged above and acted upon by the heating means, a sinuated water pipe in each chamber section, means for conducting smoke and burnt gases from each chamber section, and a hot air heating jacket arranged about the chamber and provided with air inlet and outlet means.

2. A heater of the character described including a base section, heating means arranged in the base section, a heating chamber arranged above and in communication with the heating means and formed in sections, each chamber section having a sinuated flue therein, a sinuated water pipe in each flue, a body arranged on the base and surrounding the chamber to provide an air heating jacket, a cover for the body, means for conducting cold air to the jacket, and means for conducting hot air from the jacket.

3. A heater of the character described including a base section, heating means in the section, a sectional heating chamber supported on the upper edge of the base section and acted upon by the heating means, each chamber section having an open bottom and a sinuated flue therethrough, a water conducting pipe arranged in each flue, tubes for conducting burnt gases from each chamber, a body arranged on the base and surrounding the chamber to provide an air heating jacket, a cover for the jacket, means for conducting cold air to the jacket, and means for conducting hot air from the jacket.

4. A heater of the character described including a base section, a horizontal partition arranged therein, a plurality of vertically arranged partitions carried by the horizontal partition and forming heat passages, burners supported by the horizontal partition and arranged in each of the heat passages, a sectional heating chamber mounted on the upper edge of the base section, each of the chamber sections being provided with an open bottom and having a sinuated flue therein, a sinuated water pipe mounted in each flue, tubes leading from the upper end of each chamber for conducting smoke and burnt gases therefrom, and an air heating jacket arranged about the chamber and supported by the base and having air inlet and air outlet means arranged therein.

5. A heater of the character described including a base section having door openings therein, doors for closing the openings, a draft regulating door mounted on the lower door, a heating agent support mounted in the base section and providing independent heat passages therein, a sectional heating chamber supported on the upper edge of the base section, the bottom of each chamber section being open and arranged in communication with the corresponding heat passage in the base section, a plurality of baffles mounted in each section and providing a sinuated flue therein, water conducting pipes arranged in each flue, means for conducting burnt gases and smoke from each chamber section, a body mounted on the upper edge of the base section and arranged in spaced relation with the heating chamber to provide an air heating jacket thereabout, the bottom of the body being provided with an opening, and a cover mounted on the body and having an outlet opening.

6. A heater of the character described including a base section, heating means in the base section, a body supported on the upper edge of the base section, a sectional heating chamber mounted on the upper edge of the

base section, the bottom of each chamber section being open, water conducting pipes mounted in each chamber section, other water conducting pipes mounted in the body and connected to the first mentioned water conducting pipes, means for conducting smoke and burnt gases from the chamber, and means for inclosing the upper edge of the body so that air may be heated between the body and the chamber and conducted therefrom.

In testimony whereof I affix my signature.

HARRY A. MUSSER.