No. 618,711. Patented Jan. 31, 1899.

J. McBRIDE.

HEATING APPARATUS.

(Application filed June 30, 1898.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 2.

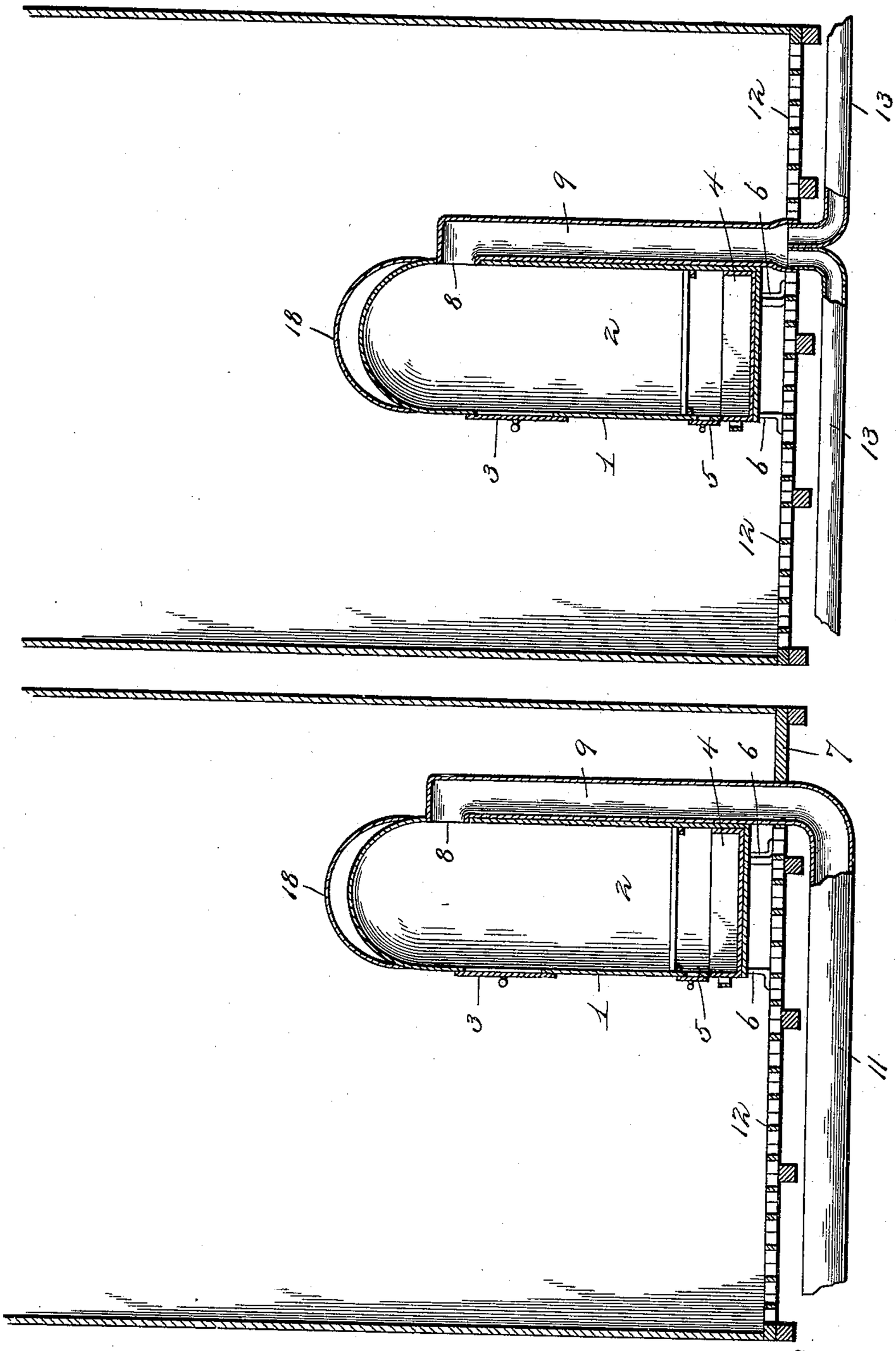

FIG. 1.

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FIG-3-

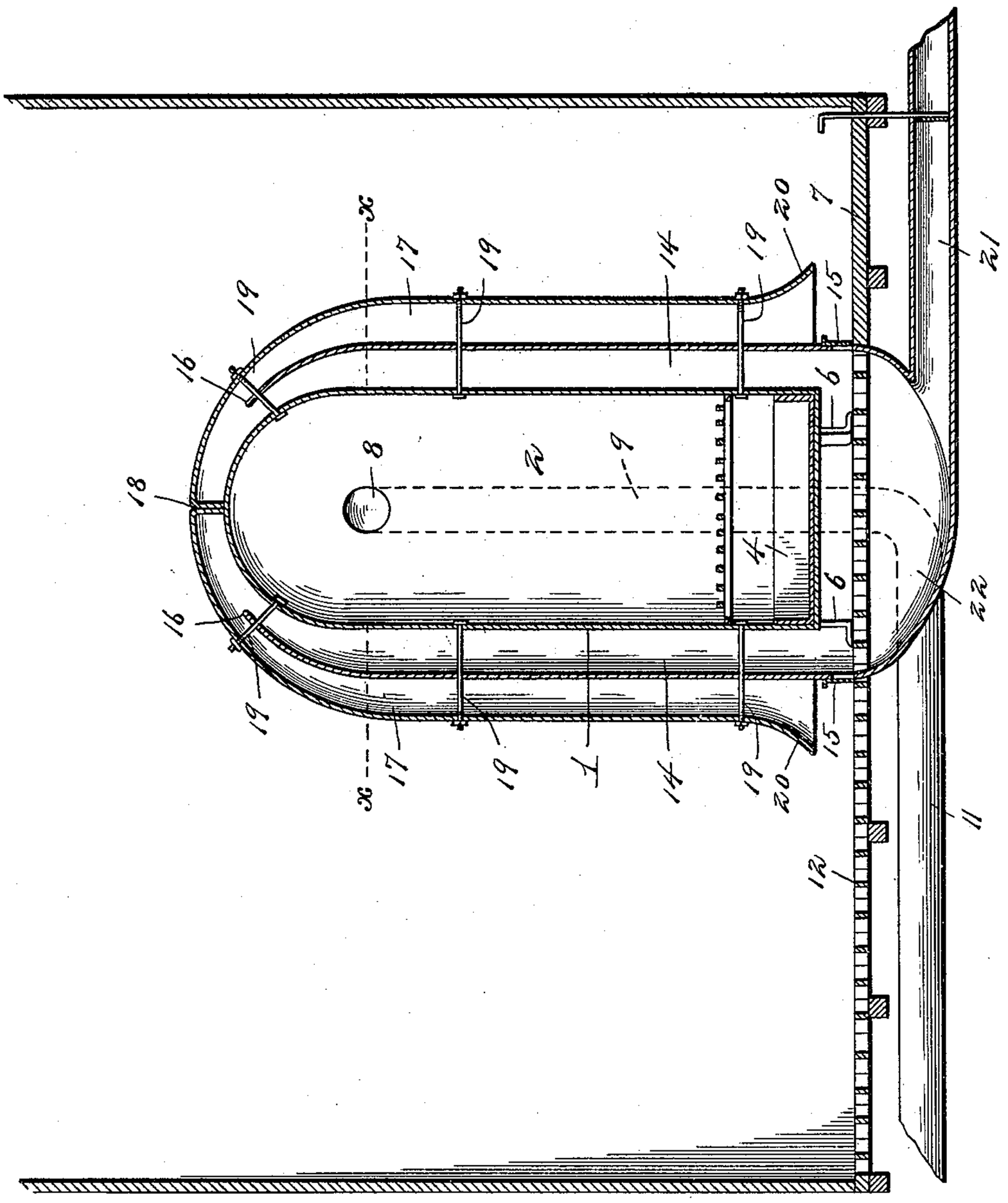
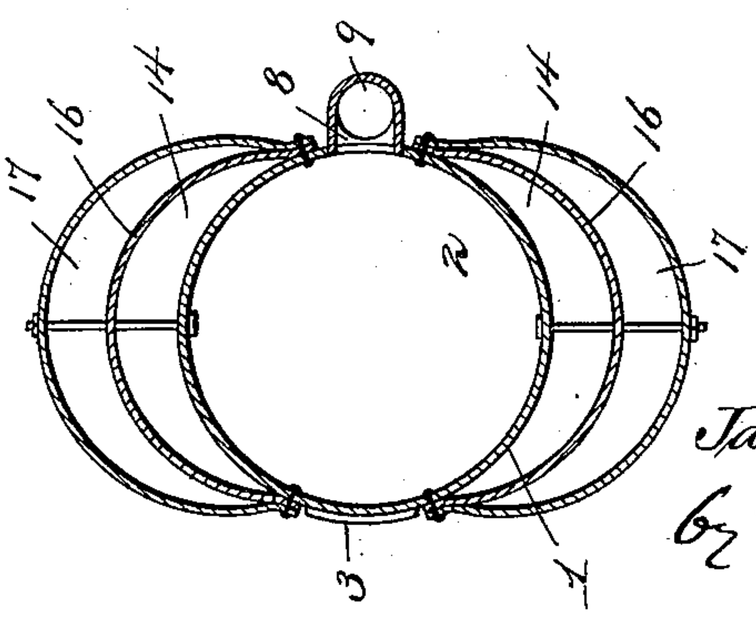


FIG-4-



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UNITED STATES PATENT OFFICE.

JAMES McBRIDE, OF GREENFIELD, IOWA.

HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 618,711, dated January 31, 1899.

Application filed June 30, 1898. Serial No. 684,858. (No model.)

To all whom it may concern:

Be it known that I, JAMES MCBRIDE, a citizen of the United States, residing at Greenfield, in the county of Adair and State of Iowa, have invented certain new and useful Improvements in Heating Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to heating apparatus, and has for its object to provide a construction of heater whereby a greater amount of heat can be obtained from a given amount of fuel than under the ordinary construction of stove.

The invention contemplates a special form of heater, and also relates to the provision in the room or building in which the heater is employed of gratings in connection with a peculiar arrangement of flues for taking off the products of combustion, whereby the full benefit of the heat is obtained before the products of combustion find their exhaust to the open air.

The details, objects, and advantages of the invention will be fully pointed out in the course of the subjoined description.

The invention consists in a heating apparatus embodying certain novel features and details of construction and arrangement of parts, as hereinafter fully described, illustrated in the drawings, and incorporated in the claims hereto appended.

In the accompanying drawings, Figure 1 is a vertical sectional view through a room, and also through a heater, a flue constructed and arranged in accordance with this invention, showing also the floor provided with a grating. Fig. 2 is a similar view showing radiating-flues extending in different directions. Fig. 3 is a sectional view, on an enlarged scale, taken at right angles to Figs. 1 and 2, showing the arrangement of return-flues at each side of the heater, and also showing the supply and exhaust flues. Fig. 4 is a horizontal section through the heater on line *x x* of Fig. 3.

Similar numerals of reference designate corresponding parts in all the views.

Referring to the drawings, 1 designates the heater, which in the main is in the form of an ordinary heating-stove, comprising a fuel compartment or magazine 2, provided with a fuel-door 3, and an ash-pan 4, having an ash and draft door 5. The heater 1 is supported upon suitable legs 6 to give the same the desired elevation above the floor, (indicated at 7.) The heater is provided at the point 8 near its upper end with an opening, with which communicates a pipe or flue 9, extending downward along the back of the stove and passing through an opening 10 in the floor, whence the flue 9 is bent to form a horizontal portion 11, which extends beneath the floor and immediately under a grating 12, so that the radiation of the heat from the flue 11 will pass upward through the grating 12 and form an additional heating appliance for the room. In Fig. 2 the same construction is illustrated, with the exception that instead of employing a single horizontal extension 11 of the flue 9 two oppositely-extending branch flues 13 are shown, and the floor of the room is provided with gratings 12, extending over both branch flues, so as to allow the heat to ascend therethrough into the room.

Referring now to Fig. 3, it will be observed that at each side the heater 1 is provided with a vertical flue 14, which may be either round or elliptical in horizontal section and which is preferably formed of thin sheet metal, the longitudinal edges of which are riveted or otherwise united to the outer surface of the heater. The flues 14 at each side of the heater extend downward to the floor; but in their outer sides they are provided with draft-doors 15, by means of which the air from the room may be admitted to or shut off from such flues. The flues 14 terminate at their upper ends at the points 16, and arranged outside of the flues 14 are other flues 17, which at their upper ends meet at the point 18, said flues, however, not communicating at such point. The outer flue 17 of each pair is, like the inner flue, formed, preferably, of thin sheet metal and secured along its opposite longitudinal edges to the outer surface of the stove or heater 1, and it may be additionally supported by means of bolts 19, connecting it to the stove. The flues 14 and 17 communicate at their upper ends at the point 16, where the inner flue terminates, and the outer flue has its lower end terminating above the floor and flared, as indicated at 20, so

that the heated air may readily pass out into the room.

21 designates the fresh-air supply, which may enter the building at any convenient point and which extends to a point immediately beneath the heater, where it is enlarged, as shown at 22, to a diameter about equal to the bottom of the heater. This enlarged portion extends upward through the flooring and supplies fresh air to the lower ends of each of the vertical flues 14. The air supplied through the pipe 21 passes upward through the flues 14, being heated in its upward progress, and upon reaching the upper ends of the flues 14 it enters the outer flues 17, passing thence downward and escaping at the flared bottoms of the outer flues 17 into the room in a heated condition. The products of combustion which pass outward through the flue 9 at the back of the heater are carried downward through the flooring and through the pipes or flues 11 and 13 and thence conducted beneath the open grating to their point of exit, the heat radiating therefrom passing upward through the gratings 12, thus affording additional heat.

From the foregoing description it will be seen that I have produced a very simple and economical form of heater which will obtain the full benefit of the heat. Not only is the air taken in through the supply-pipe heated and distributed through the room, but the radiation of heat from the products of combustion as they pass out of the room and building is taken advantage of, and thus the greatest possible amount of heat is obtained from a given amount of fuel.

It will of course be understood that any number of branch flues 13 may be employed in connection with a corresponding number of gratings and that the heater as a whole may be manufactured in various sizes, according to the number of cubic feet in the room or building to be heated. These and other changes in the form, proportion, and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a heating apparatus, the combination with a stove or heater proper, of independent vertically-extending flues at opposite sides thereof communicating with a fresh-air-supply pipe at their lower ends, and auxiliary flues arranged outside the aforesaid flues and communicating at their upper ends therewith, the auxiliary flues terminating at their lower ends adjacent to but slightly above the floor and being flared, substantially as and for the purpose specified.

2. In a heating apparatus, the combination with a stove or heater proper, of a flue for the products of combustion communicating with the upper portion of the stove and extending downward outside of the body of the heater through an opening in the floor of the room in which the heater is placed, the flue being extended beneath and substantially parallel to the floor, and an open grating situated in the floor immediately above the underlying portion of the flue, substantially as and for the purpose specified.

3. In a heating apparatus, the combination with a stove or heater proper, of a flue communicating with the upper portion of the heater and extending downward upon the outside of the heater through an opening in the floor, branch flues communicating therewith at the floor-line and extending in different directions beneath and substantially parallel to the floor, and open-work gratings arranged in the floor immediately over the underlying branch flues, all arranged substantially as and for the purpose specified.

4. In a heating apparatus, the combination with a stove or heater proper, of independent flues extending in parallel relation to and upon the outside of the heater and downward to the floor, a fresh-air-supply pipe extending upward through the floor and communicating with the lower ends of said flues, draft-doors or dampers for said flues arranged near the floor, and auxiliary flues communicating with the upper ends of the aforesaid flues and extending downward parallel thereto and terminating adjacent to but slightly above the floor, substantially as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES McBRIDE.

Witnesses:
O. D. Le Hew,
J. M. Huston.