

(No Model.)

2 Sheets—Sheet 1.

S. D. BURLINGAME.
HOT AIR HEATING STOVE.

No. 412,596.

Patented Oct. 8, 1889.

Fig. 1.

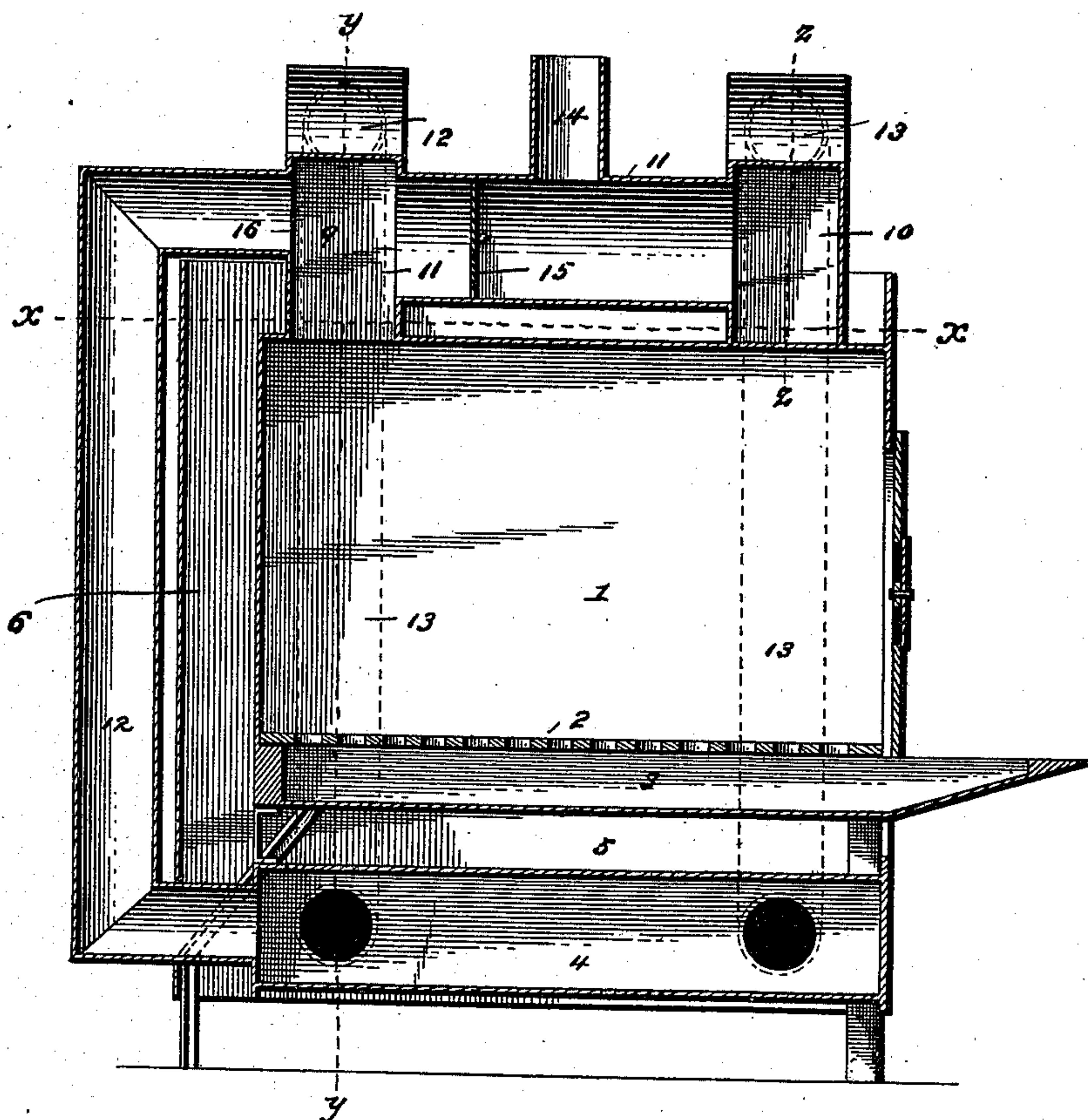
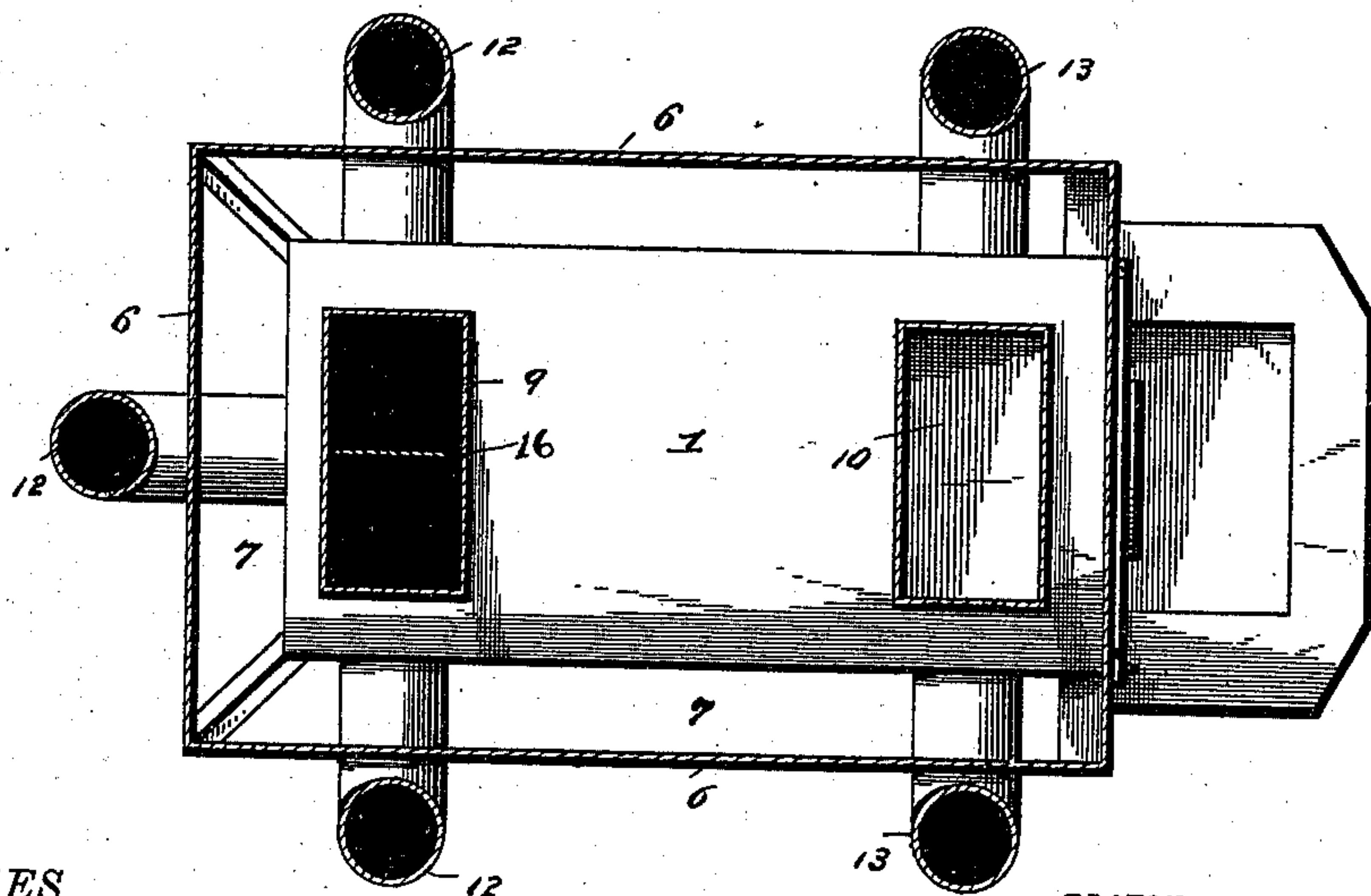


Fig. 2.



WITNESSES

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Fig. 3.

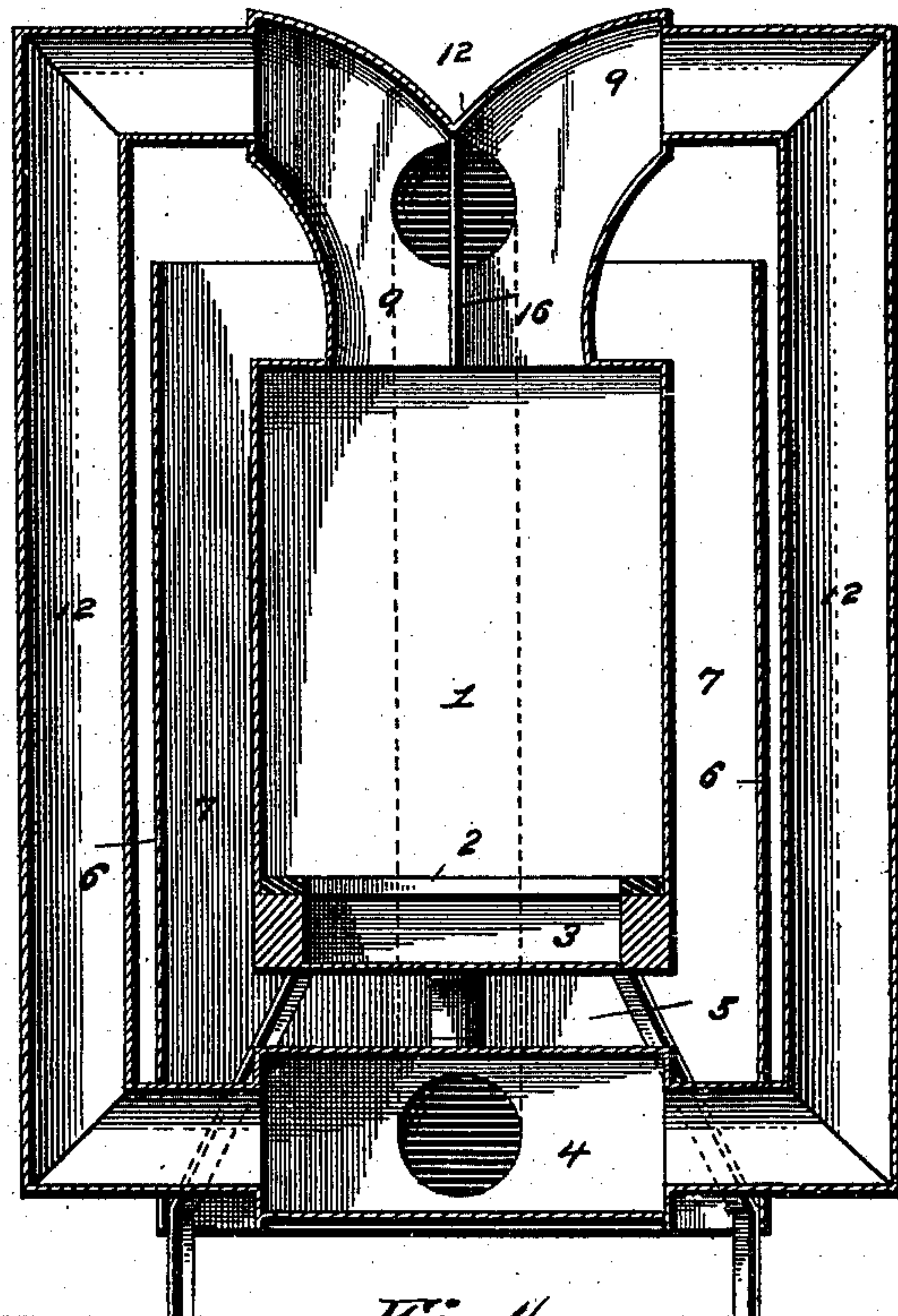
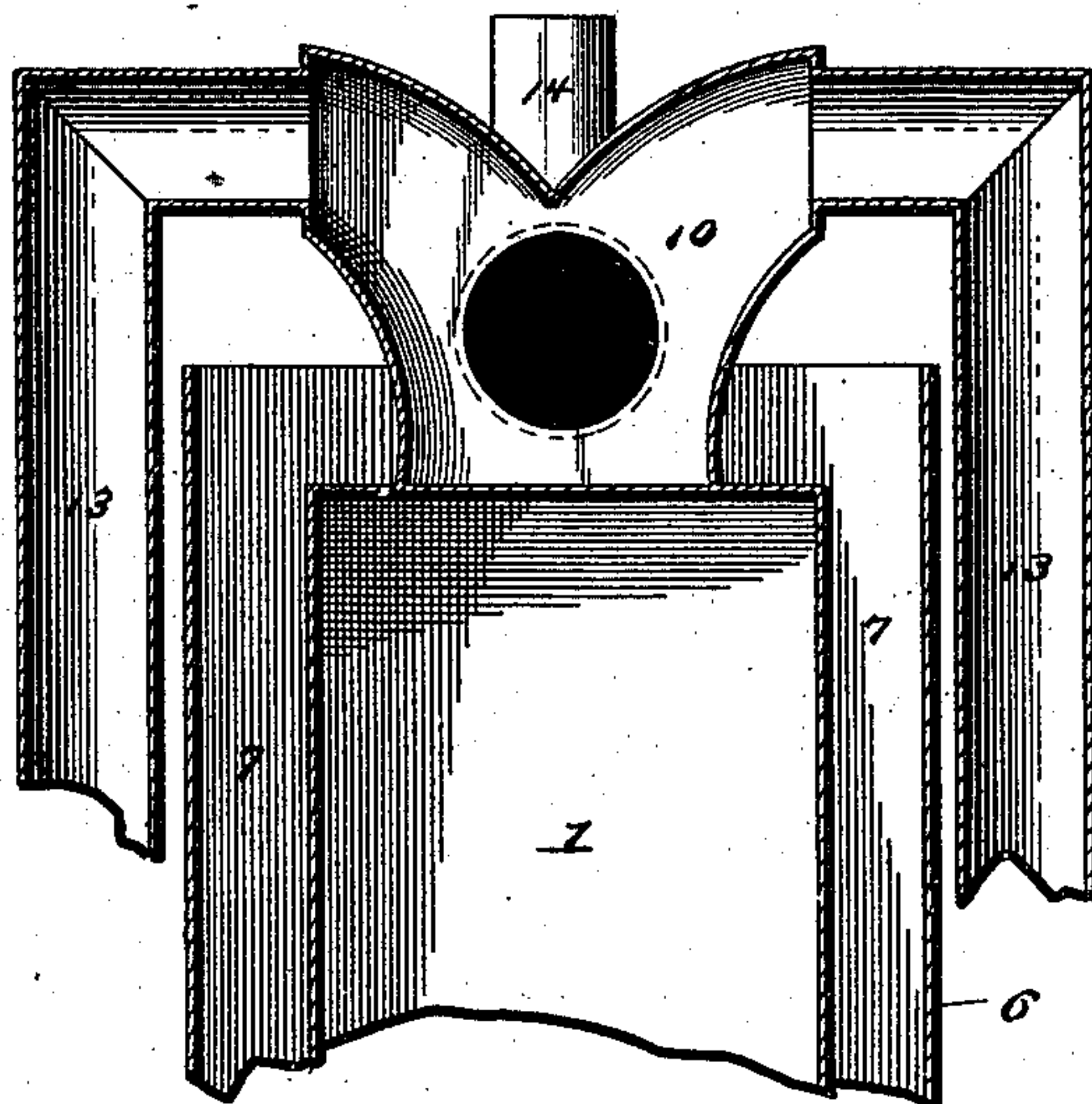


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

SIMON D. BURLINGAME, OF READING, MICHIGAN.

HOT-AIR HEATING-STOVE.

SPECIFICATION forming part of Letters Patent No. 412,596, dated October 8, 1889.

Application filed June 28, 1889. Serial No. 315,919. (No model.)

To all whom it may concern:

Be it known that I, SIMON D. BURLINGAME, a citizen of the United States, residing at Reading, in the county of Hillsdale and State of Michigan, have invented certain new and useful Improvements in Hot-Air Heating-Stoves; 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.

My invention relates to hot-air heating-stoves; and it has for its objects, among other things, to materially augment the radiating surface or area of the stove, to equalize the temperature of all parts of a room or apartment in which the stove may be placed, to ventilate the apartment, and to avoid injuring the air of the apartment by preventing the temperature of the stove or any considerable part thereof with which air comes in contact to be heated from being raised to such a degree as to consume or destroy the oxygen of the air.

With these ends in view, and such others as pertain to my invention, it consists of a vertical exterior case or shell surrounding the body of the stove and arranged equidistant therefrom at all points, so as to leave an intervening air-space between the vertical shell and body of the stove, the area of which air-space at the top of the stove where the ascending current of air escapes being equal in area to the air-space at the bottom of the stove, where the air-current is drawn in or introduced between said shell and stove.

My invention further consists in the combination of a stove, the vertical exterior case surrounding and out of contact with the stove, a heating-drum below the stove, and circulating or draft pipes located exteriorly of the inclosing shell or case and communicating at their upper ends with the stove and opening at their lower ends into said heating radiating chamber.

My invention further consists in the peculiar construction and arrangements of parts, as will be hereinafter described and claimed.

To enable others to understand and practice my invention, I will now proceed to describe in detail my preferred embodiment

thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal sectional view taken centrally through a heating-stove constructed in accordance with my invention. Fig. 2 is a horizontal sectional view on the plane indicated by the dotted line xx of Fig. 1, and Figs. 3 and 4 are vertical transverse sectional views on the planes indicated by the dotted lines yy and zz , respectively, of Fig. 1.

Like numerals denote corresponding parts in all the figures of the drawings, referring to which—

1 designates the fire-pot or combustion-chamber of my improved stove, which has the usual grate 2 and the ash-pit 3 below the grate. Below this fire-pot or combustion-chamber is located a low or radiating chamber 4, which is arranged out of contact with the wall forming the bottom of the ash-pit, to leave an intervening air-space 5, that extends throughout the entire length and breadth of the low chamber 4 and ash-pit, and in practice I preferably make this chamber 4 equal in length and width to the bottom of the fire-pot, so that both the fire-pot and the low chamber can be inclosed within a common vertical shell or case 6. This vertical shell or case is arranged at all points equidistant from the fire-pot and chamber 4, so as to provide an air-space 7 between the shell and the combustion and low chamber, this arrangement of the shell with relation to the stove providing a continuous air-space of equal area at the lower, upper, and intermediate points between the shell and stove, so that the air drawn into the lower end of said air-space and heated by contact with the stove and exterior shell has free escape from the stove through the outlet in the upper part of the stove.

Secured to the top of the combustion-chamber are two high chambers 9 10, which are located near opposite ends of the stove, and these two high chambers open into a common tubular chamber 11, which extends longitudinally above the stove, the diameter of the longitudinal tubular chamber being greater than the diameter of either of the high chambers. One of these high chambers, prefer-

ably the chamber 9 at the rear of the stove, opens into and communicates directly with the combustion-chamber, so as to receive the smoke and other products of combustion directly from the fire-pot, and this high chamber 9 is connected to the low chamber by means of downflues 12, which are located vertically, as shown, and exteriorly of the case or shell 6. The upper end of each downflue is connected with the high chamber by an elbow which is located above the exterior shell or case 6 and opens into the enlargement at one end of the high chamber 9, and the lower end of each downflue is connected to the low chamber by another elbow, which passes through the exterior case or shell 6, as shown. I preferably provide three downflues between the smoke-receiving high chamber 9 and one end of the low chamber, two of these downflues being located on opposite sides of the exterior case or shell and open at their upper ends into the enlargements at opposite sides of the high chamber, as shown, while the remaining flue of the three downflues is located at the rear of the stove and communicates in the manner described with the high and low chambers. The other high chamber 10 at the front of the stove does not communicate with the fire-pot; but it is connected to the low chamber, so as to receive the smoke, &c., therefrom, by means of upflues 13, said flues being located on opposite sides of the case or shell 6, exteriorly thereof, and opening into the high and low chambers in the same manner as the downflues, as is perfectly obvious from an inspection of the drawings. The longitudinal tubular chamber 11 has an outlet or escape opening 14, into which is adapted to be fitted an exit-pipe (not shown) for conveying smoke, &c., to a chimney. Between this outlet-opening and the receiving high chamber 9, that communicates with the combustion-chamber, is located a damper 15, by opening which the smoke and other products of combustion can be permitted to escape directly through the high and longitudinal chambers into the exit-pipe; but when this damper is closed the smoke passes through the downflues into the low chamber, thence through the low chamber into the upflues, and from the latter to the chambers 10 and 11 to the exit-pipe. It is obvious that a current of air will be drawn through the space 7 between the combustion and low chambers and the exterior shell 6, and that the air on its passage through the space will be heated by contact with the walls of the chambers and the exterior shell. By thus creating a circulation of air through the shell I am enabled to ventilate the apartment and maintain an equilibrium of temperature therein, no matter what position in the room the stove may occupy.

I have observed that if a stove constructed as herein specified is placed near one end of a room that end or portion of the apartment

most remote from the stove will be heated to the same temperature as the end nearer to the stove, which phenomenon may be due to a larger percentage of the air being drawn from the remote end of the room and replacing the colder air by heated air from the stove. Another important advantage arising from the construction herein specified lies in the fact that the temperature of the combustion-chamber or any considerable part of the stove does not rise to such a point as to injure or destroy the oxygen in the atmosphere, which is due largely to the fact that the heat of the stove is rapidly carried off by the air circulating between the combustion-chamber and exterior shell in contact with the walls of said combustion-chamber and to the rapid radiation of the heat by the several chambers and down and up flues.

By arranging the exterior shell so as to leave the intervening space 7 between said shell and the combustion and low chambers and locating the down and up flues exteriorly of the shell I very materially augment the radiating area or surface of the stove, and thereby increase the quantity of heat radiated in proportion to the fuel consumed and effect an economy of fuel consumed and the time necessary to thoroughly heat an apartment or room. Another important advantage arising from locating the radiating-tubes exteriorly of the vertical inclosing-shell is that they serve to carry off the heat and products of combustion from the fire-box and radiate the same more rapidly than if the tubes were arranged in the space between the stove and shell, and thus prevent the fire-box from attaining such a temperature as to deprive the air of oxygen, &c. It is obvious that the exteriorly-arranged radiating-tubes are located in a cooler atmosphere, and thus radiate the heat more rapidly, and that they do not obstruct the free circulation of air between the shell and combustion-chamber, which thus allows the heat radiated from the combustion-chamber to be carried directly into the room by the ascending currents of air.

In order to properly direct the smoke, &c., into the three downflues from the smoke-receiving high chamber 9, I provide a vertical partition 16, which is so located as to cause the smoke to enter the downflues uniformly when the damper is closed.

The upper end of the exterior shell or case 6 is extended above the horizontal plane of the upper surface of the combustion-chamber, whereby air is drawn by the ascending current of air flowing between the stove and shell 6 over the top of the combustion-chamber.

I do not restrict myself to the exact details of construction and form and proportion of parts herein shown and described as an embodiment of my invention, as I am aware that alterations therein can be made without departing from the spirit or sacrificing the

advantages of my invention, the essential features of which will be pointed out in the claims.

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

1. In a hot-air heating-stove, substantially as described, the combination of a combustion-chamber, an exterior vertical shell concentric with and equidistant from the combustion-chamber throughout its length, the upper and lower ends of said shell being open, a low chamber arranged beneath the combustion-chamber within the vertical shell, the high chambers, and the vertical up and down flues arranged exteriorly of the vertical exterior shell and having the elbows at their ends, which enter the high and low chambers, for the purpose set forth, substantially as specified.

2. In a hot-air heating-stove, the combina-

tion of a combustion-chamber, a high chamber communicating therewith, another high chamber isolated from communication with the combustion-chamber, a longitudinal chamber intermediate of both high chambers and having a damper located therein between the smoke-receiving high chamber and the smoke-outlet opening, a low chamber located beneath the combustion-chamber, an exterior case surrounding the combustion and low chambers, and the down and up flues located exteriorly of the inclosing-case and communicating with the high and low chambers, substantially as and for the purpose described.

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

SIMON D. BURLINGAME.

Witnesses:

JOS. FORREST,

WILLIAM O. BELT.