

No. 848,220.

PATENTED MAR. 26, 1907.

J. E. ALBINSON.
HOT AIR HEATER.

APPLICATION FILED JUNE 7, 1906.

2 SHEETS—SHEET 1.

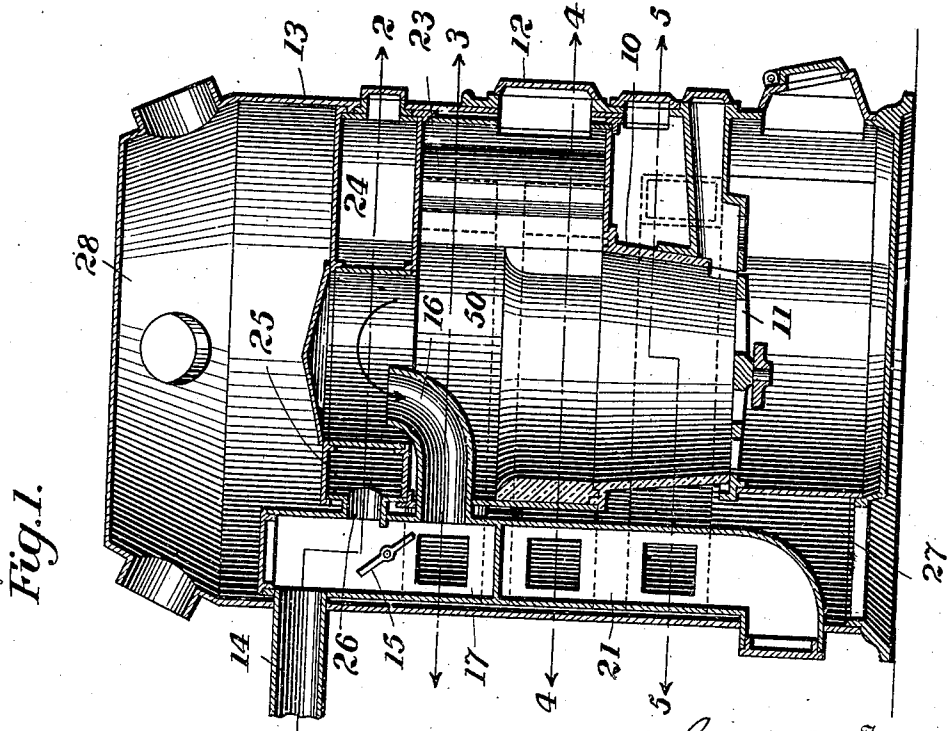
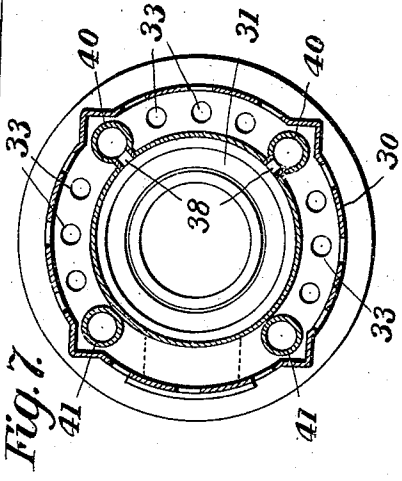
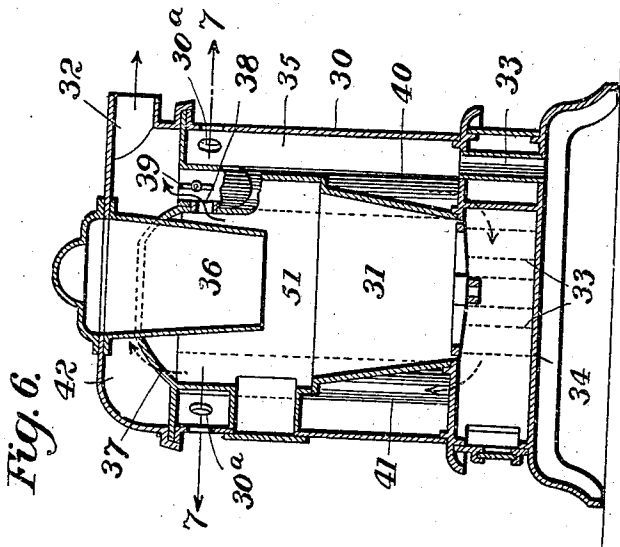


Fig. 1.

Witnesses
J. J. Stindel
J. M. Cooney

Inventor
James E. Albinson
 By *Foster Greeman & Watson*
 Attorneys

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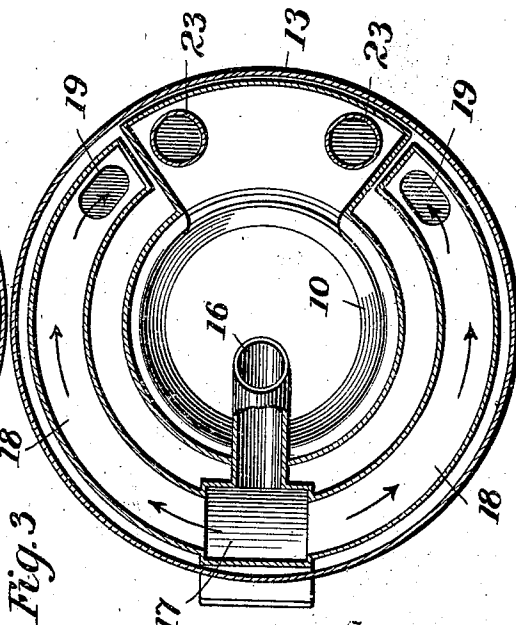
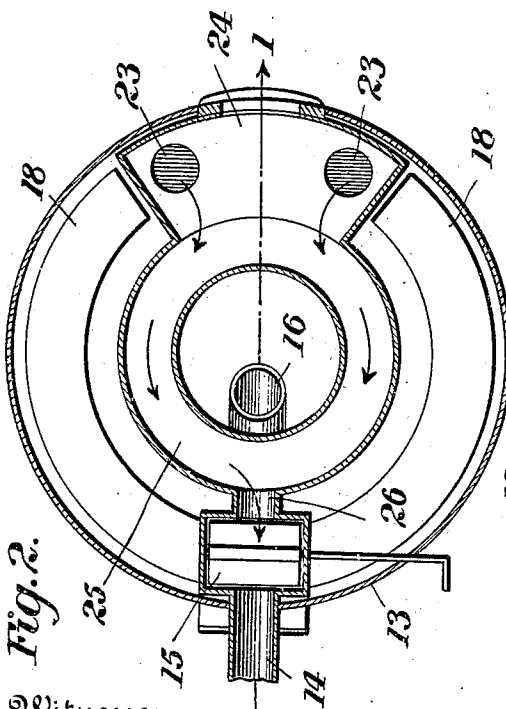
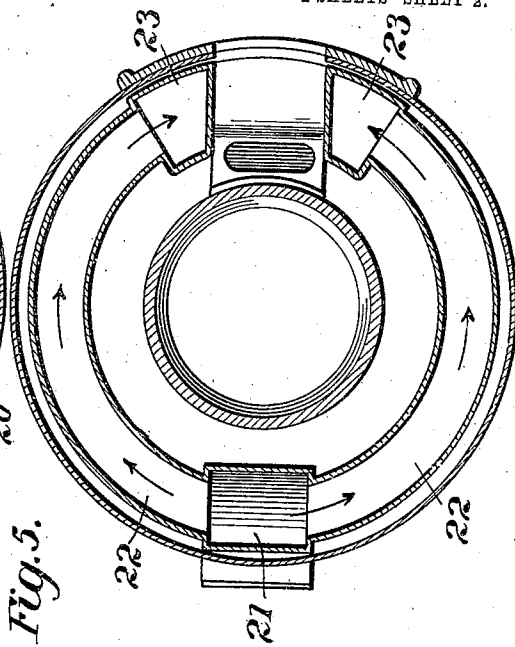
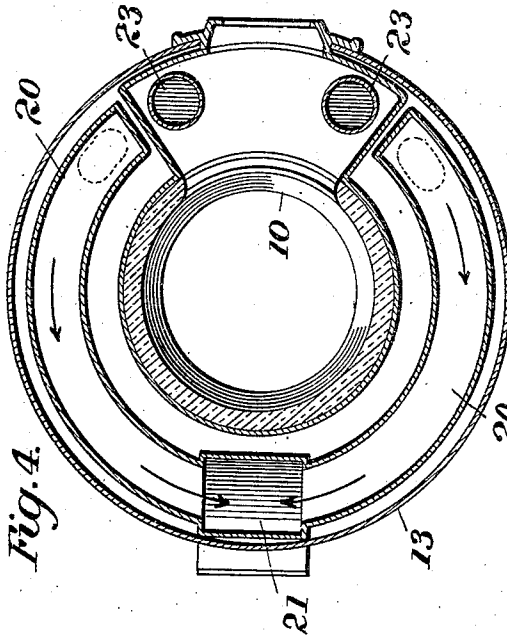


Fig. 2.

Fig. 3.

Witnesses
J. E. Albinson
J. M. Barrett

Inventor
James E. Albinson
by Foster Heuman & Watson
Attorneys

UNITED STATES PATENT OFFICE.

JAMES E. ALBINSON, OF WASHINGTON, DISTRICT OF COLUMBIA.

HOT-AIR HEATER.

No. 848,220.

Specification of Letters Patent.

Patented March 26, 1907.

Application filed June 7, 1906. Serial No. 320,672.

To all whom it may concern:

Be it known that I, JAMES E. ALBINSON, a citizen of the United States, and a resident of Washington, District of Columbia, have invented certain new and useful Improvements in Hot-Air Heaters, of which the following is a specification.

This invention relates to improvements in hot-air heaters, such as heating-stoves, latrobes, and furnaces of the class in which air is circulated through heated flues and casings and then distributed to the various rooms or apartments to be heated.

The object of the invention is to provide an extended radiating-surface with which the air to be heated may come in contact without impairing the chimney-draft necessary to the operation of the heater. The invention will be described in connection with the accompanying drawing, in which—

Figure 1 is a vertical sectional view of a hot-air furnace embodying my invention, the section being taken on the line 1 1 of Fig. 2. Figs. 2, 3, 4, and 5 are horizontal sections, respectively, taken on the lines 2, 3, 4, and 5 of Fig. 1. Fig. 6 is a vertical section of a heating-stove embodying the invention, and Fig. 7 is a section on the line 7 of Fig. 6.

Referring to Figs. 1 to 5 of the drawings, 10 indicates the fire-pot, 11 the grate, 12 the feed-door, 13 the outer casing, and 14 the smoke-pipe, of a hot-air furnace. In starting the fire the damper 15 is opened more or less, as shown in Fig. 1, and the furnace-gases pass out through the pipes 16 past the damper 15 and through the smoke-pipe 14, taking the most direct route to the smoke-pipe. When the damper 15 is closed, the hot gases pass into the chamber 17 below the damper 15, Figs. 1 and 3, then through circular flues 18 to the forward part of the furnace, then down through vertical flues 19 to a second set of circular flues 20, Fig. 4, to a flue 21 at the rear of the furnace, then downward through flue 21 to a pair of circular flues 22, leading to the front of the furnace, then up through a pair of vertical flues 23 in the combustion-chamber 50 to a chamber 24 above the plane of the first-mentioned circular flues 18. From the chamber 24 the gases pass around through a circular flue 25 to a flue 26 at the rear of the furnace, which flue leads the gases direct to the smoke-pipe 14 above the damper 15. The course of the air just described is indicated by arrows in the several views. The casing 13 encircles the various

flues 18, 20, 22, and 25, and the air to be heated enters the chamber 27 at the bottom of the furnace and circulates upward on both sides of these flues to the dome 28 at the top of the furnace, from which dome it is distributed to the various parts of the building. The flues 18, 20, and 22 form an extensive heating-surface for the air, by means of which most of the heat in the gases of combustion is extracted. In order to maintain a good draft in the smoke-pipe and chimney, sufficient to cause the hot gases to circulate downward through circular flues above described, the gases are reheated by passing them through the reheating-chamber formed by the compartment 24 and the circular flues 25. It will be noted that the circular flues 25 are directly above the fire-pot and subject to the direct heat of the fire, the lower walls of flues 25 forming the upper wall of the combustion-chamber.

I have found by actual test that the construction above described is adapted to heat air very economically and effectively without impairing the draft necessary to keep the furnace in operation. Heretofore the gases of combustion have been in some cases robbed of their heat to such an extent that the chimney-draft has been impaired. I am able to maintain a good chimney-draft and still expose the air passing through the furnace to a very large heating-surface by reheating the cooled gases sufficiently before passing them into the chimney.

In Figs. 6 and 7 I have shown the invention embodied in a heating-stove, referring to which figures 30 indicates the outer casing of such a heating-stove; 31, the fire-pot; 51, the combustion-chamber, and 32 the smoke-pipe. A series of flues 33, extending upward from openings in the base 34 of the stove, permit air to enter the compartment 35, surrounding the fire-pot, which air passes from said compartment through the openings 30^a in the ornamental parts of the casing 30. 36 indicates a hopper through which the stove is fed, and 37 indicates a dome surrounding the hopper and forming a partition across the stove. The gases of combustion pass out through an opening 38 and directly to the smoke-pipe 32 when the valve or damper 39 is open. When the damper is closed, the combustion-gases pass downward through flues 40 into the chamber beneath the fire-pot and then pass up through flues 41 to the compartment 42 above the dome 37. The

compartment 42 communicates directly with the smoke-pipe, as seen in Fig. 6. As shown, the down-pipe 40 has two branches, the damper being in the upper part above the junction of the branches. In passing through the compartment or chamber 42 at the top of the stove the gases are reheated and the chimney-draft is thus maintained. It will be noted that the partition or dome 37, forming the floor of the chamber 42, is directly over the fire-pot and subjected to a high degree of heat.

In the following claims I shall use the term "hot-air heater" in a sense broad enough to include all heaters in which the air is circulated through the interior of the stove and in contact with heated flues.

It will be understood that various changes in details of construction and arrangement of the forms illustrated may be made without departing from the spirit and scope of my invention.

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

1. In a hot-air heater, the combination with a combustion-chamber and an outer casing between which the air circulates, of a flue through which the combustion-gases are circulated in a downward direction, a flue through which the gases pass in an upward direction, and a reheating-flue above said combustion-chamber for reheating the gases to preserve the chimney-draft, the lower wall of said reheating-flue constituting the upper wall of the combustion-chamber.

2. In a hot-air heater, the combination with an outer casing and a combustion-chamber, of a series of flues within the casing through which the combustion-gases are circulated and about which the air to be heated circulates, and a reheating-flue above the combustion-chamber through which the combustion-gases are passed after circulating

through said flues, whereby the said gases are reheated and the chimney-draft maintained, said reheating-flue and combustion-chamber having a common intermediate wall.

3. In a hot-air heater, the combination with a combustion-chamber and an outer casing, of a vertical series of horizontally-arranged flues within the casing, means for passing the combustion-gases downward and through said horizontal flues successively, a reheating-flue above the combustion-chamber, means for conducting the combustion-gases from the lowermost of said flues to said reheating-flue, and a damper adapted to permit the combustion-gases to pass directly to the smoke-pipe or to cause said gases to circulate through said horizontally-arranged flues, said reheating-flue and combustion-chamber having a common intermediate wall.

4. In a hot-air heater, the combination with a combustion-chamber and an outer casing between which the air circulates, of a plurality of horizontally-arranged flues within the casing, said flues being circular and substantially concentric with the casing, passages or openings between said flues in staggered arrangement, a damper for directing the combustion-gases through said flues and passages, a reheating-flue over the fire-pot and above said flues, means for conducting the combustion-gases from the lowermost of said flues to said reheating-flue, a passage from said reheating-flue to the smoke-pipe, and a passage from the combustion-chamber to the smoke-pipe, said reheating-flue and combustion-chamber having a common intermediate wall.

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

JAMES E. ALBINSON.

Witnesses:

ARTHUR L. BRYANT,
THOMAS DURANT.