

No. 626,997.

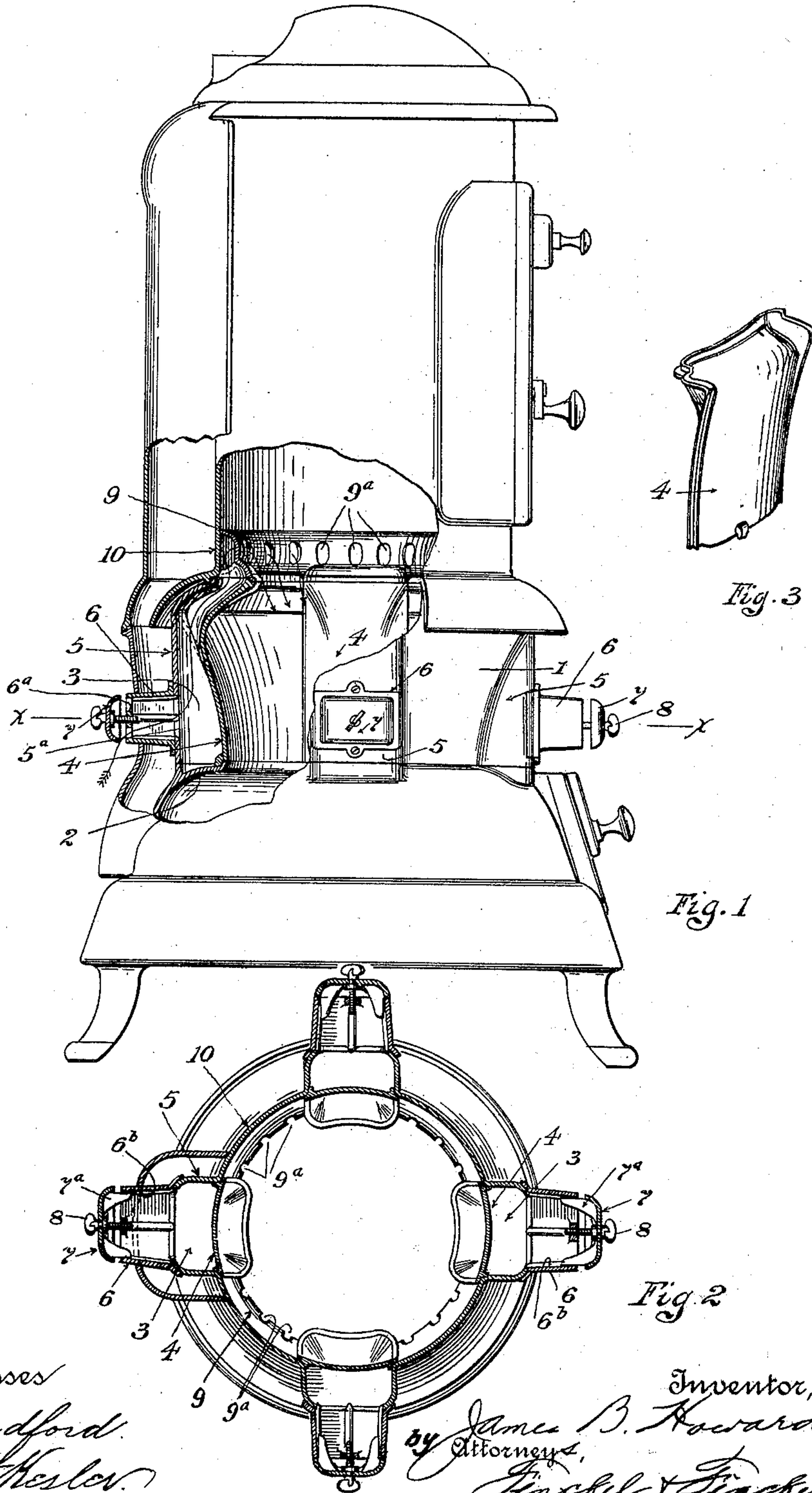
Patented June 13, 1899.

J. B. HOWARD.
HEATING STOVE.

(Application filed Feb. 15, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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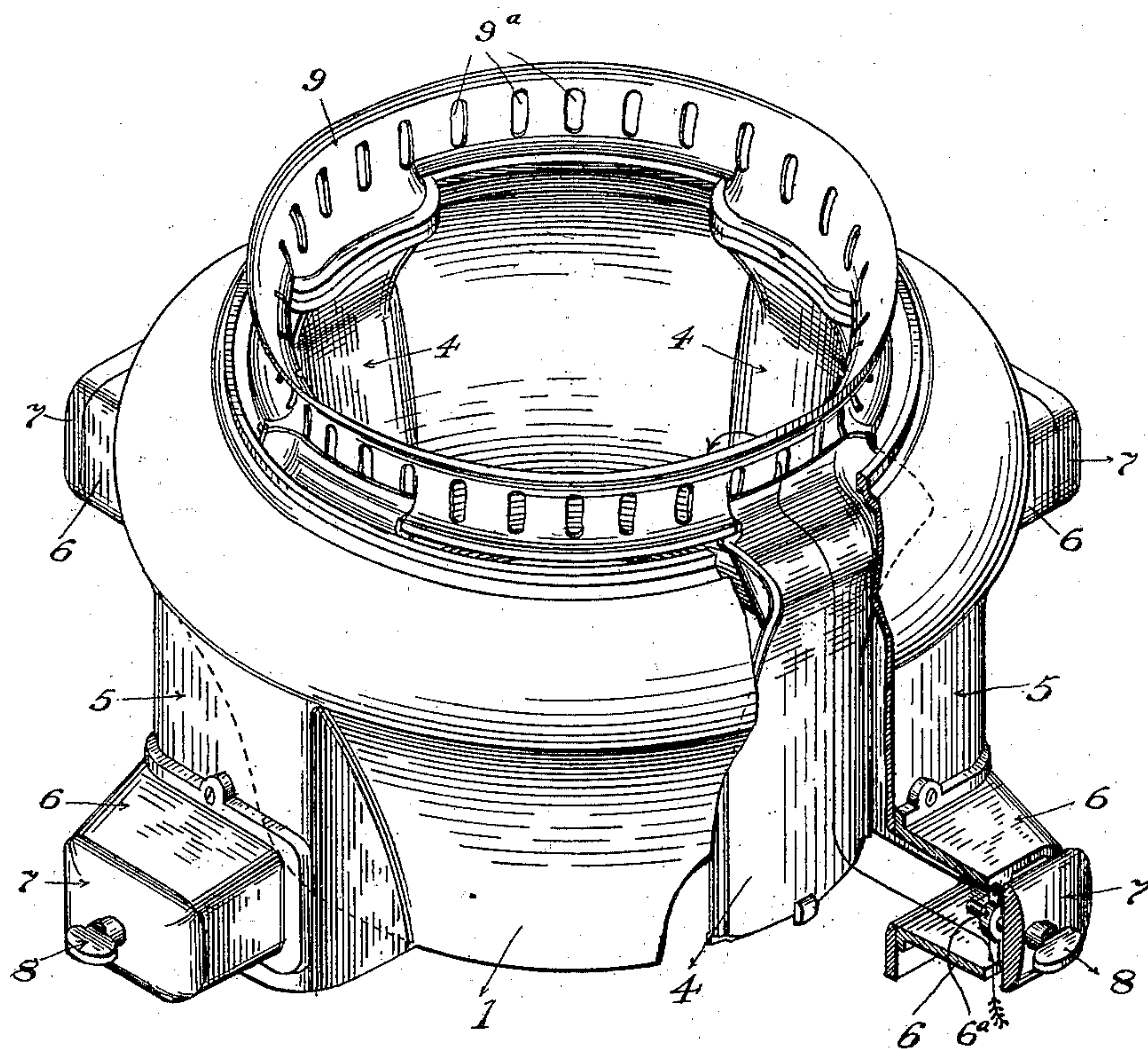


Fig. 4

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UNITED STATES PATENT OFFICE.

JAMES B. HOWARD, OF COLUMBUS, OHIO.

HEATING-STOVE.

SPECIFICATION forming part of Letters Patent No. 626,997, dated June 13, 1899.

Application filed February 15, 1899. Serial No. 705,521. (No model.)

To all whom it may concern:

Be it known that I, JAMES B. HOWARD, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in 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.

In the consumption of fuel, and especially of bituminous or soft coal, a large portion of the heating power thereof is lost through the escape of the carbureted hydrogen and other gases and minute particles of coal and smoke evolved in the burning process. Moreover, the minute particles of coal and smoke accumulate rapidly in the form of soot in the pipes and flues, choking the same and preventing the free draft necessary in proper combustion of the fuel.

As is well known, ordinary combustion consists of the chemical union of the oxygen of the air with the carbon and hydrogen of the fuel; but before this union can be initiated and continued the elements must be heated to a high specific degree, and it therefore follows that if the air introduced and mingled with the gases, &c., rising from the fuel be sufficiently heated the combustion of those gases, &c., can be effected before they escape into the pipes and chimneys, where their ignition will be impracticable. Attempts to heat and mingle air with the gases, &c., rising from the fuel for the purpose of consuming the gases have been made, but so far as I am informed without success, because of the failure to insure such a thorough heating of the oxygen of the air and its introduction at the proper point and in quantity abundant to effect the ignition of the gases, &c.

The object of my invention, therefore, is to provide a construction of stove in which the air is heated to such a degree and introduced and mingled with the gases as they rise from the fuel in such quantity that the practically complete combustion of those gases as well as the smoke is insured.

My invention consists in the construction hereinafter set forth and claimed.

In the accompanying drawings, in which I have shown an embodiment of my invention,

Figure 1 is a side view of a heating-stove with parts broken out to illustrate the interior construction thereof. Fig. 2 is a horizontal sectional view on the line *xx* of Fig. 1, looking upward. Fig. 3 is a perspective view of a plate constituting part of the fire-pot adjacent the air-heating flue; and Fig. 4 is a perspective view of the fire-pot on a larger scale, the air-heating flues, and air-heating ring or chamber, a part of one of the air-heating flues being broken out, as shown in section.

Like characters of reference in the several views designate corresponding parts.

1 marks the fire-pot, which is of cast-iron and bulges outward at its upper part, but has a somewhat contracted top. The fire-pot rests upon the base 2 over the ash pit or chamber and has no communication therewith except through the grate-opening.

At one or more points (preferably at four equidistant points) on the fire-pot are formed air-flues 3. These flues are formed between plates 4, constituting part of the fire-pot and the outer shell 5. In the lower part of the outer shell 5 or nearly on a level with the lower end of the fire-pot is an opening 5^a, to which is attached a horizontally-standing air inlet or duct 6, provided with a door or valve 7. The door or valve is preferably supported on a thumb-screw 8, swiveled therein and threading into a bar 6^a, cast across the outer end of the duct, and in order that the door may be opened and closed in a right line it is furnished with splines or feathers 7^a to enter grooves 6^b in the sides of the duct 6.

Supported upon the top of the fire-pot and extending entirely around the same is a hollow ring 9, made with liberal openings 9^a on its inner side. The outer side of this ring is closed by the sheet-steel combustion-chamber 10 when set in place, (see Fig. 1,) and the under side communicates with the hot-air flues 3 only, and all air passing into the flues must pass through the ring.

The location of the ring at the contracted top of the fire-pot insures the introduction of the highly-heated air directly in contact with the products of combustion immediately after leaving the bed of fire, thereby effecting a more certain and rapid union of the gases at the proper place in the stove.

It will be observed that the outer sides of

the flues 3 are straight, while the inner sides of the plates 4, forming part of the fire-pot, incline inward toward their lower ends. Hence the flues are wide at the bottom and narrow and contracted at the top, so that all air in passing up through the flues comes into close contact with or proximity to the highly-heated fire-pot, thus insuring an intense heating of the air before it passes into the ring and fire-pot.

In locating the air-heating flues at several equidistant points about the fire-pot, as shown, a uniform and abundant supply of highly-heated air to be commingled with the gases and smoke rising from the surface of the fuel is effected, thus insuring the practically complete consumption of those gases and the smoke. With this construction, therefore, I add to the ordinary heating power of the coal the heating power of the ignited gases evolved from the coal, and thus save what has heretofore passed up the chimney and been wasted. It follows, therefore, that with my stove less fuel is required to obtain the desired temperature of air in rooms or buildings and a large saving in fuel bills effected, and, further, that a rapid and excessive accumulation of soot in the pipes and chimney is avoided.

What I claim, and desire to secure by Letters Patent, is—

1. In a stove, a fire-pot 1 bulging outwardly at its upper part and having a contracted top, a hollow ring 9 located at the top of the fire-pot and having openings 9^a, and a flue or flues 3 for heating air communicating with the hollow ring and bent inwardly and being narrow or contracted at its upper end, the wall of the fire-pot forming one side of said flue, substantially as shown and for the purpose described.

2. In a stove, a fire-pot 1 bulging outwardly at its upper part and having a contracted top, a hollow ring 9 located at the top of the fire-pot and having openings 9^a, a flue or flues 3 for heating air communicating with the hollow ring and bent inwardly and being narrow or contracted at its upper end, the wall of the fire-pot forming one side of said flue, an inlet or duct 6 at the lower part of flue 3 having bar 6^a and grooves 6^b, the valve or door 7 having splines or feathers to enter grooves 6^b, and a thumb-screw 8 swiveled in said door and threaded in the bar 6^a, substantially as and for the purpose shown and described.

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

JAMES B. HOWARD.

Witnesses:

ABRAHAM B. HUSTON,
JOHN W. SNYDER.