

914,922.

E. R. CAHOONE.
STOVE.

APPLICATION FILED NOV. 30, 1903.

Patented Mar. 9, 1909.

2 SHEETS—SHEET 1.

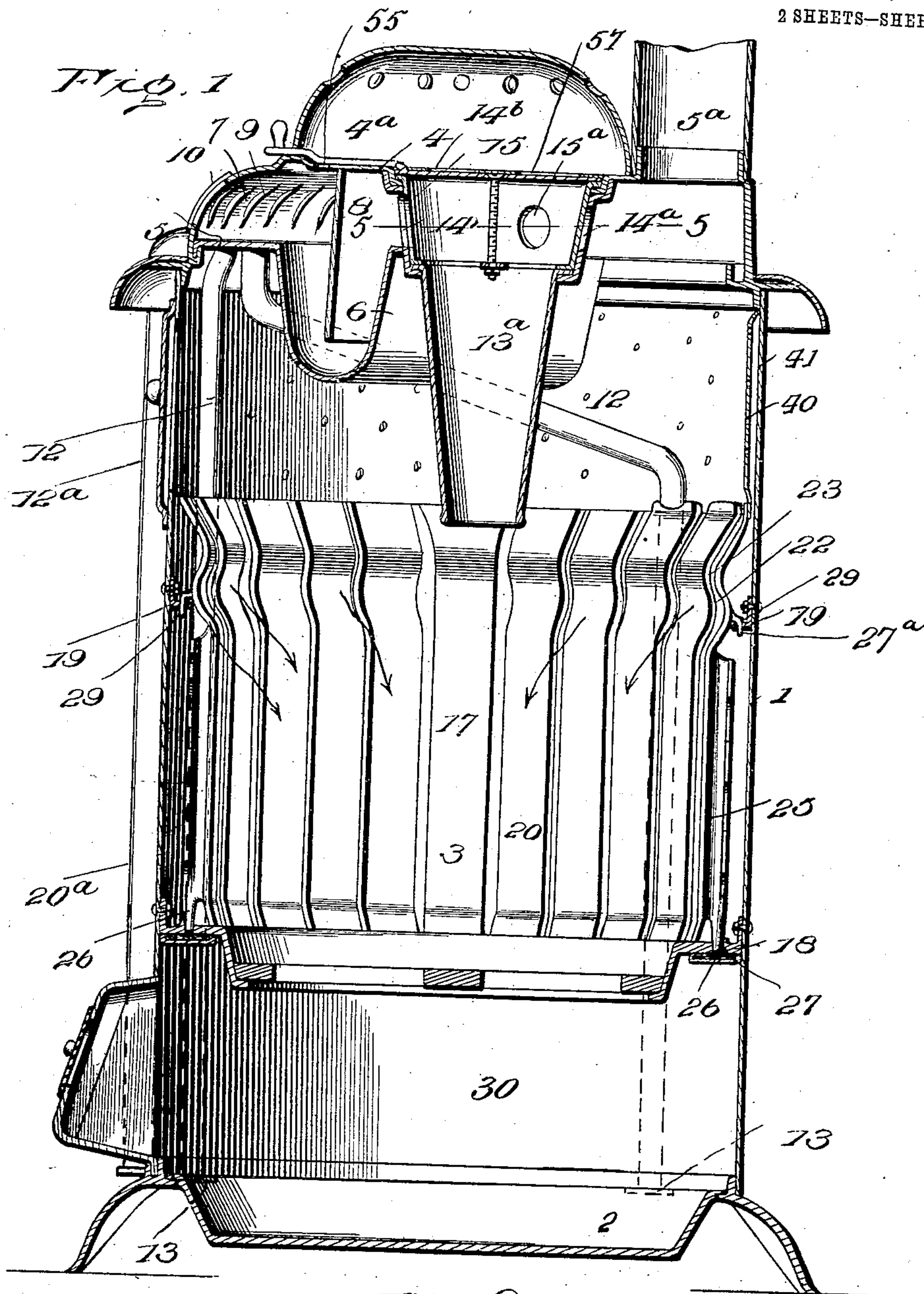
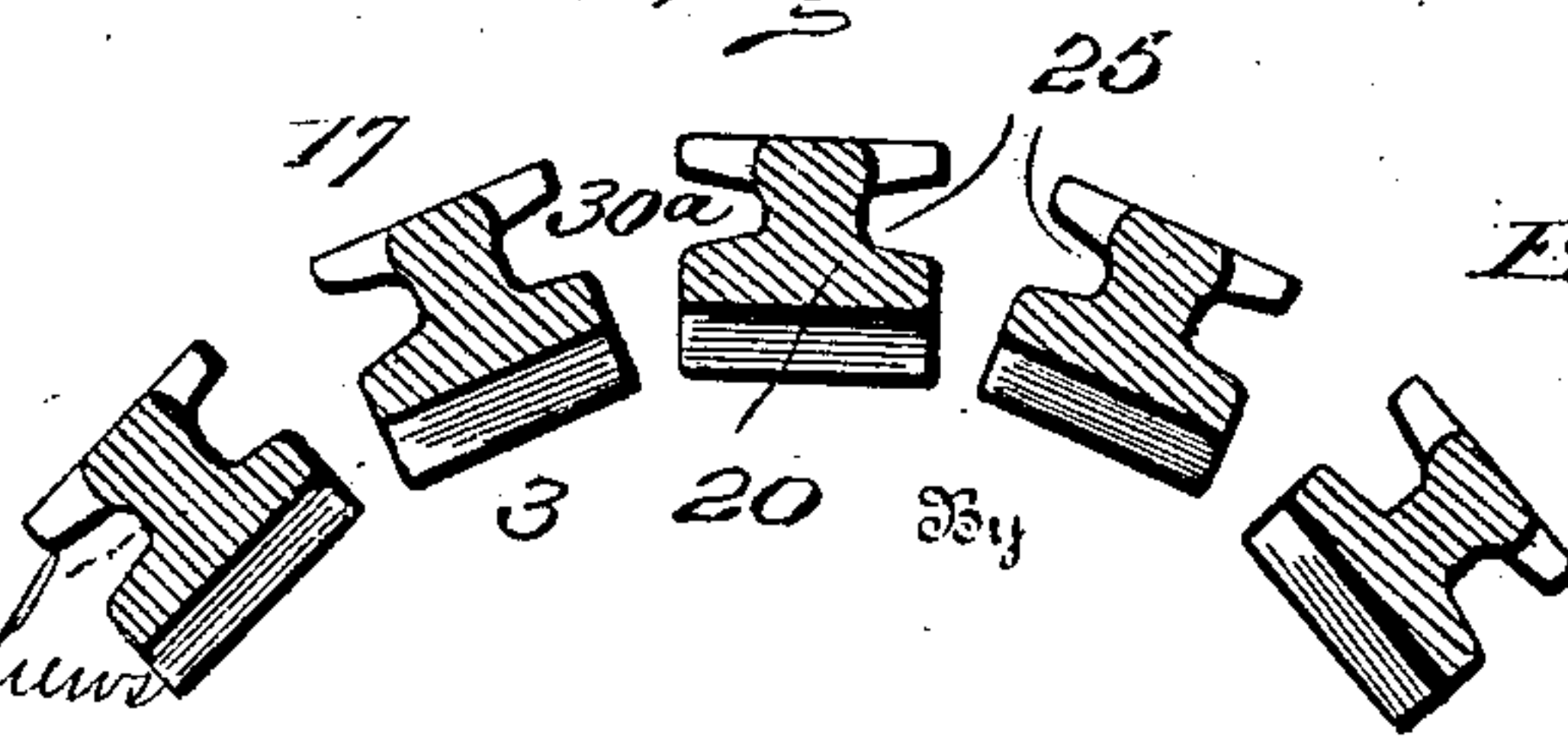


Fig. 2.



Witnesses

W. W. Williams

Keniza Matthews

Inventor

E. R. Cahoon

Attorney

914,922.

E. R. CAHOONE.
STOVE.
APPLICATION FILED NOV. 30, 1903.

Patented Mar. 9, 1909.
2 SHEETS—SHEET 2.

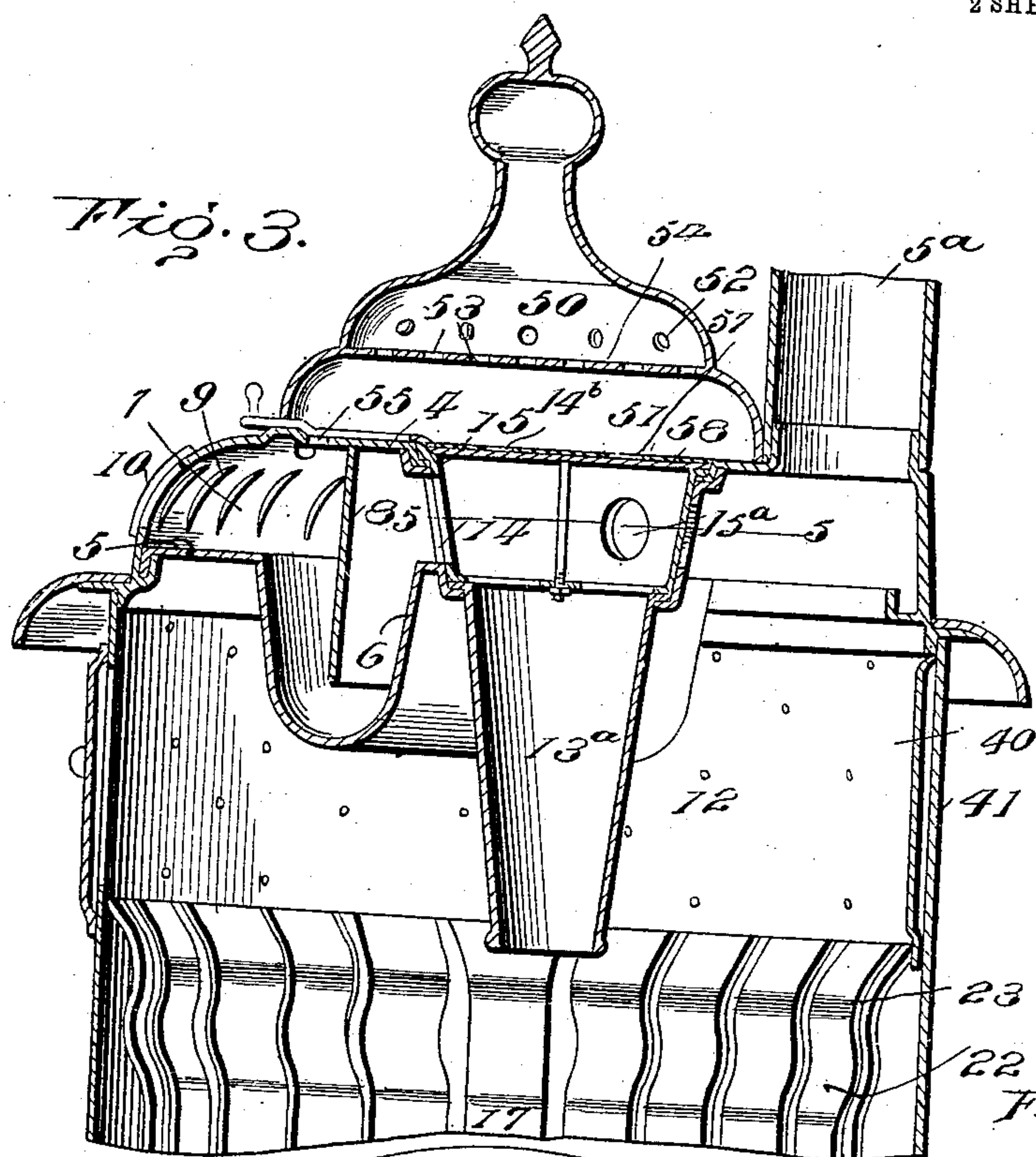
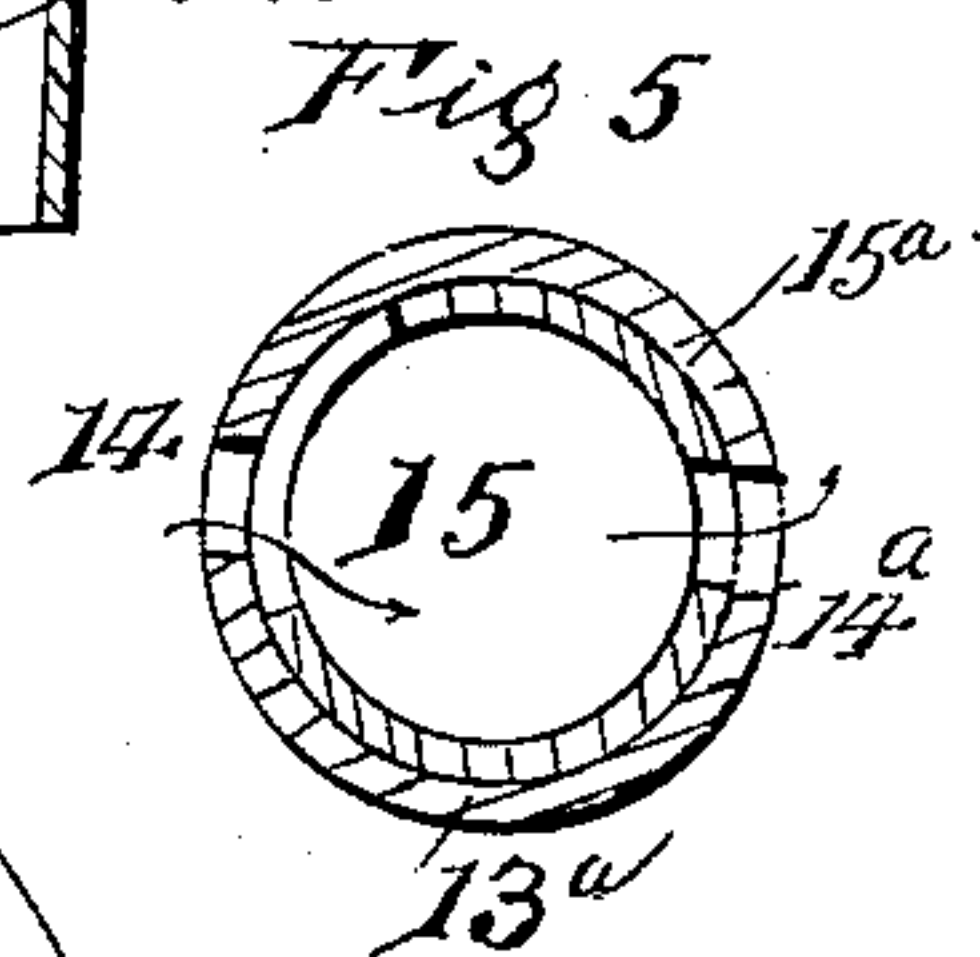
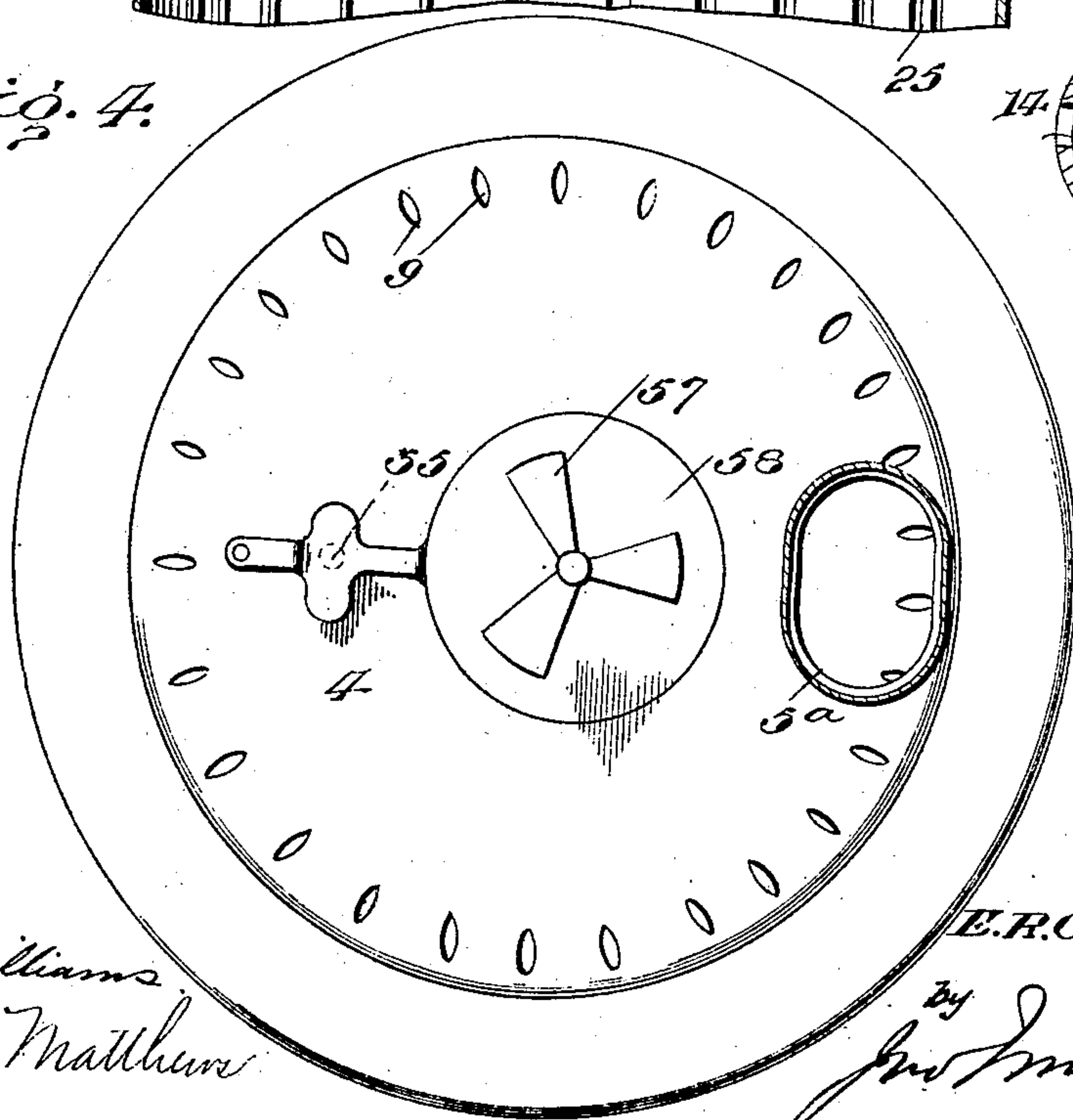


Fig. 4.



Witnesses
W. A. Williams
Deputy Matthew

Inventor
E. R. Cahoon
by
J. W. Miller
Attorney

UNITED STATES PATENT OFFICE.

EDWIN R. CAHOONE, OF SUMMIT, NEW JERSEY.

STOVE.

No. 914,922.

Specification of Letters Patent.

Patented March 9, 1909.

Application filed November 30, 1903. Serial No. 183,201.

To all whom it may concern:

Be it known that I, EDWIN R. CAHOONE, a citizen of the United States, residing at Summit, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Stoves, of which the following is a specification.

This invention relates to improvements in stoves, and primarily to the details of construction thereof.

The object of the invention is to provide an air heating chamber at the top of the stove structure, that the air therein may be heated to the best advantage, while being delivered to the fuel. Furthermore, I propose forming this chamber in such a manner that a pocket thereof will depend somewhat within the stove, and to insure the air being heated therein, I arrange a baffle plate to deflect the incoming air in contact with the said pocket; the chamber communicates with air delivering means of suitable construction, such for instance as a tube, and air may be introduced to the chamber direct from the atmosphere or preheated in inside or outside ducts leading from the bottom of the stove structure.

A further object of the invention is to construct the fire pot of a series of spaced apart bars, communicating with an air heating chamber surrounding the pot, to introduce streams of heated air to the fuel from the sides, to cooperate with the heated air introduced from the air heating chamber above.

In order therefore to carry out the objects of this invention to the best possible advantage, I have found it necessary to devise specific details of construction, which will be hereinafter described and particularly pointed out in the claims.

In the drawings, Figure 1 is a vertical section of my improved stove. Fig. 2 is a detail horizontal section of a fragment of the fire pot. Fig. 3 is a vertical central sectional view of a modified form of my invention. Fig. 4 is a plan view of the same, the upper portion of the stove being removed, to more clearly illustrate the damper. Fig. 5 is a detail horizontal section on the line 5-5, Fig. 3, the damper being turned to direct the heated air direct to the exit flue.

The numeral 1 represents the stove casing; 2 the base; 3 the fire pot; 4 the top; 5 the supplemental top, and 5^a the exit flue. A pocket 6 depends from the supplemental top 5 into the stove toward the fire pot, and

communicating with the pocket 6 is an air heating chamber 7. A baffle plate 8 is suspended from the top 4 into the pocket 6, to cause the air to contact with the walls of said pocket and prolong its travel to the fuel. The walls of the chamber 7 may have openings 9 for the admission of air, and these openings may be controlled by a damper 10. Air thus admitted to the chamber direct from the atmosphere may not always suffice to give the best combustion, as the chilling effect often tends to reduce the temperature. However, to overcome this objection, I have provided ducts 12 on the inside and ducts 12^a on the outside, which open to the atmosphere at or near the bottom of the stove, and being positioned to be heated by the products of combustion in the fire pot, the air before entering the chamber necessarily becomes highly heated. Dampers 13 may be conveniently placed to regulate the supply of air passing into the tubes, and if circumstances may warrant the dampers 10 and 13 may be manipulated so as to supply air to the chamber from either or both openings 9 and ducts 12 and 12^a. Above the top 4, is an auxiliary air heating chamber 4^a, communicating with a tube 13^a, by means of openings 14^b. The chamber 7 communicates with the tube 13^a by means of an opening 14, a damper 15 controlling the admission of air to the tube. Air enters the chamber 4^a direct from the atmosphere and is introduced to the tube, 13^a, through the openings 14^b, when air from the chamber 7 is fed to the fuel through the said tube. To stop the supply of air to the fire pot, the damper 15 is turned, an opening 15^a therein registers with an opening 14^a in the tube and the air from the chamber passes direct to the exit flue.

The fire pot and its adjuncts form an important part of this invention, in that by its peculiar construction I am enabled to introduce a series of streams or sheets of heated air to the fuel, to cooperate and mix with the air introduced to the top thereof by the tube. The fire pot 3 is composed of a series of individual bars 17, supported on a casting 18 at the lower end, and by a casting 19 near their upper ends. Each bar is straight, as shown at 20, at the end of which is formed an inner depression 22, above which is formed a rounded portion 23, and then it inclines outwardly toward the casing. Each bar is provided with side grooves 25, and a

projection 26 which takes into openings 27 in the casting 18, while other projections 27^a opposite depression 22 take into openings 29 in the casting 19. The details of these bars as described, form a series of air heating chambers 30^a, into which and through which air is introduced from the ash pit 30, and by reason of the varying area of the chambers formed between the fire pot and the stove casing the air is caused to contact with the structure, which thoroughly heats and mixes it with the gases liberated from the fuel.

When the fire pot is assembled, the bars are spaced apart slightly for the passage of air and gas, and when the fuel becomes packed in places the air being introduced around it, it soon consumes the adjacent strata and the pack crumbles. The depressions 22 form an undercut pocket or chamber which when the fuel packs above or below it, allows of air being introduced downwardly from the chambers 30^a as indicated by the arrows in Fig. 1.

A stove thus constructed is admirably adapted for consuming fuels of questionable quality, as the various air currents serve to attack it at such points that ignition is sure to result. This is particularly true of low grade fuels, which cake or pack when they reach a certain temperature.

The air entering the chamber 7 strikes the baffle plate 8 and is deflected down and under the same, through the opening 14 to the tube, and I desire to emphasize at this point the fact that inasmuch as the stove shown in the drawing is of the up-burning type, the products of combustion in escaping to the exit flue contact with and highly heat the pocket 7. It is for this reason I desire to locate the pocket at the top of the stove, as it positively insures the ingoing air being heated. The air delivered to the top of the fuel through the tube has a tendency to drive the streams of air from between the bars down into the fuel, which disseminates and mixes the air with the liberated gases. Furthermore the mixture of air and gas rising from the fuel causes an additional mixing of a portion of the air from the tube, with the result that the gases are subjected to and agitated by various currents of heated air, and a comparatively perfect combustion is produced.

I may use the inner casing 40 above the fire pot, to form an auxiliary air heating chamber 41. The casing 40 is perforated, and the air from around the fire pot is introduced to the escaping products of combustion just before the exit flue is reached.

In the modifications shown in Figs. 3 and 4, I have shown two air heating chambers 50 and 51 above the top of the tube 13^a. Air enters the chamber 50 through openings 52, and then passes through openings 53 in a partition 54 to the chamber 51, from whence

the now highly heated air passes through an opening 55 into the chamber 7, and pocket 6 and into the top of the tube 13^a, through the openings 57. The damper 58 is so shaped and mounted that the openings 55 and 57 are simultaneously covered and uncovered to regulate the air entering the fire pot. While I have omitted the tubes 12 and 12^a in the modification it is obvious they may be employed if desired.

The advantages incident to the passing of air through several chambers and introducing a plurality of currents to a single chamber should require no further explanation. Sufficient to say that I have found that the hotter the air is before being introduced to the fuel, the better the combustion obtained.

What I claim as new is:

1. In a stove, the combination with a fire pot, an air heating chamber having a pocket which is closed at its lower end and extends downwardly within the stove toward the fire pot, said pocket communicating with the air heating chamber, a baffle plate in said chamber and extending within said pocket to direct air toward the bottom thereof, means for supplying air to the air heating chamber, a tube for delivering heated air from the pocket to the fire pot, and an exit flue located above the fire pot.
2. In a stove, the combination with an air heating chamber having a pocket which is closed at its lower end and a baffle plate extending in said pocket, means for supplying air to the air heating chamber, a tube for delivering the heated air from the pocket to a fire pot, a fire pot formed with a series of slots, an air heating chamber surrounding said fire pot and with which said slots communicate, means for supplying the latter air heating chamber with air, the air delivered from the tube and the slots in the fire pot mixing under the influence of the draft, and an exit flue above the fire pot, said exit flue being located to cause the escaping products of combustion to contact with the closed end of the pocket to heat the air passing through said pocket to the tube.
3. In a stove, the combination with a fire pot, of means for introducing a series of sheets of air therein, means having an air pocket for introducing a supply of heated air above the fuel, and an exit flue located above the fire pot, said exit flue being positioned to cause the escaping products of combustion to contact with the pocket to heat the air passing therethrough.
4. In a stove, the combination with a fire pot, of an air heating chamber having an air pocket closed at its lower end and communicating at its upper end with the air heating chamber, a tube for directing heated air from the pocket to the fire pot, and a plurality of means having their inlets at different levels for introducing air to the air heating cham-

ber, the air introduced to said air heating chamber passing through the pocket and thence to the tube to the fire pot.

5 5. In a stove, the combination of a fire pot with an air heating chamber formed with a pocket at or near the top of the stove, said pocket being closed at its lower end and communicating at its upper end with the air heating chamber, a tube for directing heated air
10 from the pocket to the fire pot, and an exit flue located at or near the top of the stove.

6. In a stove, the combination with a fire pot, of an air heating chamber formed above the fire pot near the top of the stove and having a pocket and a baffle plate depending
15 from the top of the chamber and into the pocket, a tube for directing heated air from the pocket to the fire pot, a damper for controlling the heated air passing through the
20 tube to the fire pot, means having air inlets at different levels for supplying air to the air heating chamber, and an exit flue located at or near the top of the stove.

7. In a stove, the combination with a casing, a fire pot, and a stove top, a pocket extending within the stove and toward the fire
25 pot, a baffle plate suspended within the pocket and terminating a short distance from the bottom thereof to form a passage, means
30 for directing the heated air from the pocket to the fire pot, means for supplying air to the pocket, and an exit flue communicating with the stove at a point above the plane of the pocket.

35 8. In a stove, the combination with a casing, a fire pot, a main air heating chamber near the top of the stove and having a pocket, a tube, an auxiliary air heating chamber above the tube formed with openings communicating with said main air heating chamber and the tube, a damper to control the air
40 admitted to the tube and chamber, and an exit flue above the pocket, the products of combustion passing to the exit flue contacting with the pocket to heat the air therein.

9. In a stove, the combination with a casing, a fire pot spaced from the casing to form an air heating chamber, an air heating chamber formed at the top of the stove and having
50 a depending pocket which is closed at its lower end, a baffle plate in the pocket, means

for introducing air to the air heating chamber at the top of the stove, flues opening to the atmosphere at the bottom for introducing air to said air heating chamber, said flues
55 being located inside the casing and passing through the space between the casing and the fire pot, a tube for directing air from the pocket to the fire pot, and an exit flue communicating with the stove above the pocket. 60

10. In a stove, the combination with a fire pot, an air heating chamber having a depending pocket closed at the bottom and in open communication at the top with said air heating chamber, a baffle plate depending
65 from the air heating chamber and into the pocket, a tube for directing heated air passing through the pocket to the fire pot, and an exit flue communicating with the stove at or near the top and above the plane of the
70 pocket.

11. In a stove, the combination with a casing, of a fire pot, an air heating chamber located at or near the top of the stove and having a depending pocket which communicates
75 with said air heating chamber, a tube having an opening to direct heated air from the pocket to the fire pot and other openings which communicate with the interior of the stove, a valve formed with openings and operating in the tube, said openings being positioned that air may be directed from the
80 pocket to the tube to the fire pot or direct to the interior of the stove above the fire pot, and an exit flue communicating with the
85 stove above the plane of the openings in the tube.

12. In a stove, the combination with a casing, a main air heating chamber at or near the top of the stove, having a pocket closed
90 at its lower end and communicating at its upper end with said air heating chamber, an auxiliary air heating chamber communicating with the main air heating chamber, a tube for directing heated air from the pocket
95 to the fire pot, and an exit flue at or near the stove top.

EDWIN R. CAHOONE.

Witnesses:

FRANK SHRAUDER,
JNO. IMIRIE.