

No. 688,956.

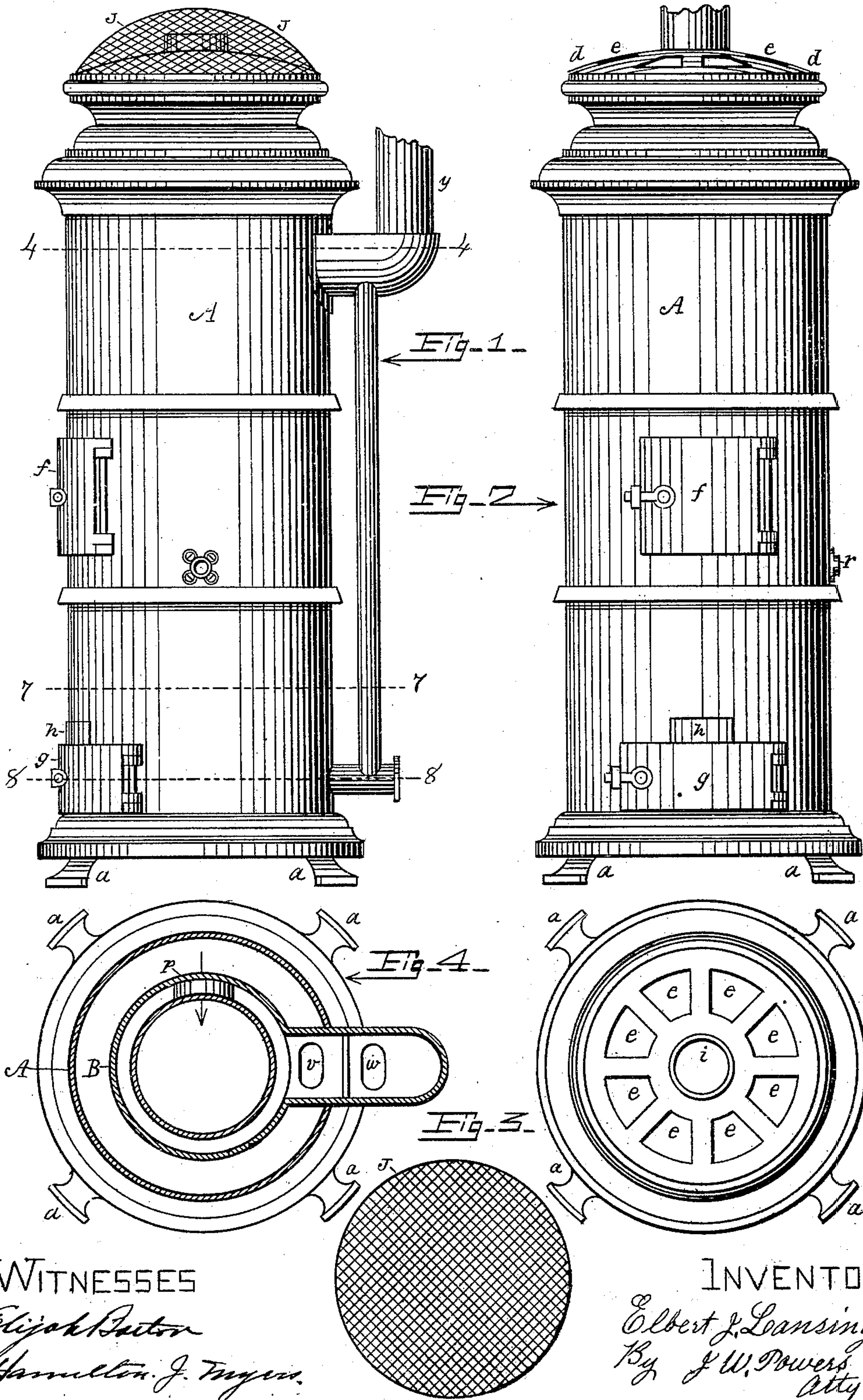
Patented Dec. 17, 1901.

E. J. LANSING.  
HEATING STOVE OR FURNACE.

(Application filed Dec. 24, 1900.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES

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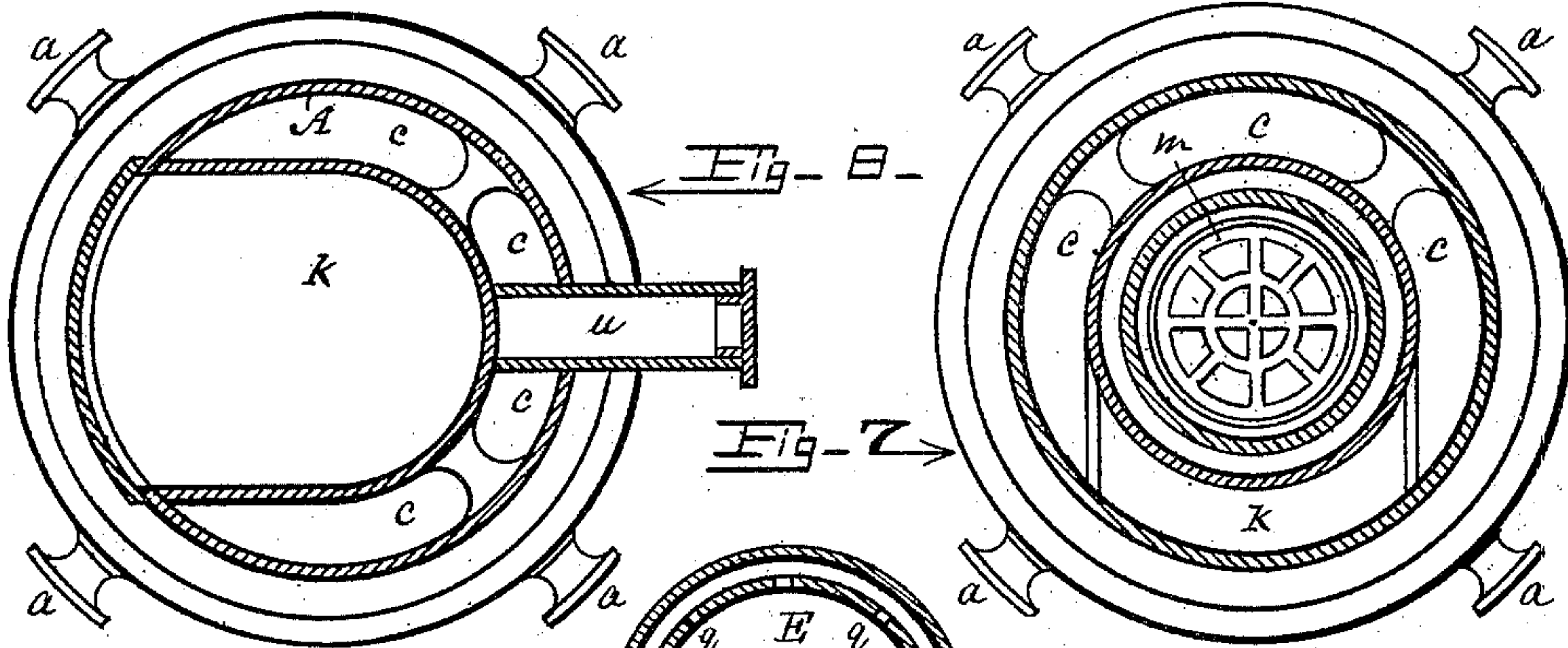
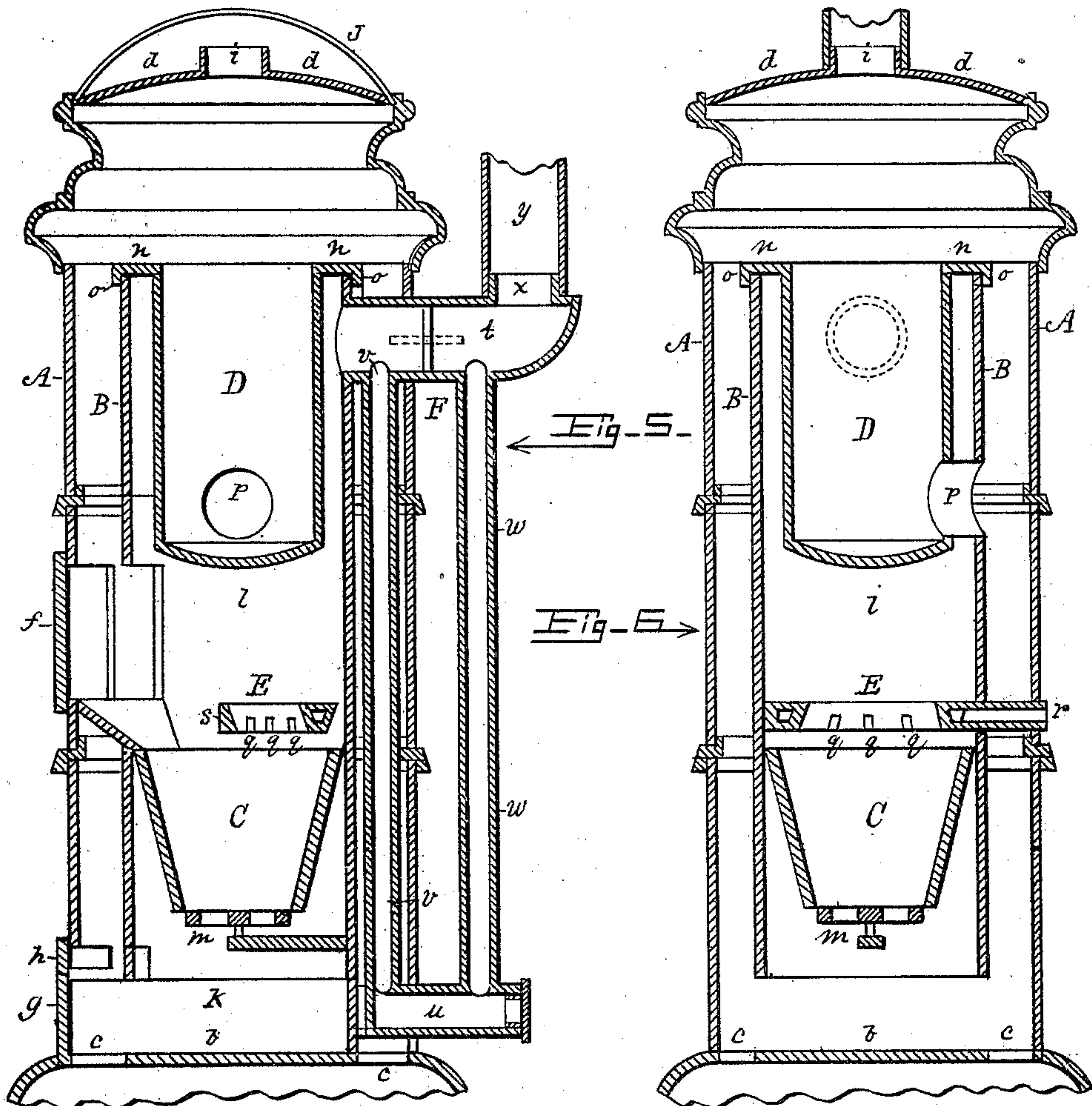
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2 Sheets—Sheet 2.



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# UNITED STATES PATENT OFFICE.

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## HEATING STOVE OR FURNACE.

SPECIFICATION forming part of Letters Patent No. 688,956, dated December 17, 1901.

Application filed December 24, 1900. Serial No. 41,003. (No model.)

*To all whom it may concern:*

Be it known that I, ELBERT J. LANSING, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented a new and useful Improvement in Heating Stoves or Furnaces, of which the following is a full, clear, and explicit description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to heating apparatus, and has for its object the production of a device which is adapted to be used as a stove to heat the room in which it is placed and rooms communicating therewith or as a furnace warming rooms connected therewith by means of hot-air pipes in the usual manner.

To this end my invention consists of the device shown in the drawings, to which reference has been invited, and in which—

Figure 1 is a side elevation; Fig. 2, a front elevation; Fig. 3, a top view; Fig. 4, a section of Fig. 1, taken on the line 4 4; Fig. 5, a longitudinal vertical section; Fig. 6, a vertical cross-section; Fig. 7, a horizontal section of Fig. 1, taken on the line 7 7; Fig. 8, another horizontal section of Fig. 1, taken on the line 8 8; and Fig. 9, details, being a horizontal and a cross section of air-feed.

Similar letters refer to similar parts throughout the several views.

A novel feature of my invention is the base or bottom plate, which plate is provided with openings through which the cold air from the floor enters the annular chamber intermediate the outer and inner cases. Hence the fire-pot is at all times in direct contact with the open air of the room, thereby preventing its warping out of shape or of its disintegrating.

Another novel feature is that the cap or top plate is in like manner provided with openings through which the heated air escapes from the aforementioned annular chamber, thus creating a draft of cold air from the floor, heating it in transit and discharging it from the top of the stove or through the hot-air pipes when the same is used as a furnace.

Still another novel feature is that the air which feeds combustion is taken into the com-

bustion-chamber through the air-feed and is supplied to the fuel from above the grate, with the result that all of the gas generated in the fire-pot is consumed and converted into heat, which is either set free in the room or is conveyed through the aforementioned hot-air pipes to other rooms.

In the drawings, A is the outer case or shell of my stove or furnace. B is the inner case; C, the fire-pot; D, the hot-air chamber; E, the air-feed, and F the draft-pipes.

The outer case A may be of either cast-iron or of sheet metal, as the manufacturer may elect, or it may be made partly of cast-iron and partly of sheet metal, as shown. Again, it may be fashioned in one piece or it may consist of several sections, as shown, preferably the latter. Its configuration or proportion is not an important feature; but in practice I make it cylindrical in form, its height being about three times its diameter. It is mounted upon feet *a*, which support it off the floor. Its base or bottom *b* (shown in Fig. 7) is fashioned with openings *c*, through which the cold air enters, and its cap or top plate *d* (shown in Fig. 3) is fashioned with similar openings *e*, from which the hot air escapes.

*f* is a door opening into the combustion-chamber, through which the fuel is inserted. *g* is a similar door opening into the ash-pit, through which the ash-pan is inserted or withdrawn, and *h* is a clinker-door, through which a poker may be inserted to free the grate.

The cap *d*, like the base *b*, is fashioned with openings *e* and with an upwardly-extending thimble *i*, adapted to receive a hot-air pipe when converting the stove into a furnace.

*j* is a screen covering the top *d* when in use as a stove, but is removed when in use as a furnace. It is useful only in preventing anything of considerable size from falling into the hot-air chamber.

The inner case B rests upon and extends upward from the base *b*, its lower section *k* constituting the ash-pit its middle section supporting and surrounding the fire-pot, and its upper section *l* constituting the combustion-chamber.

The fire-pot C is not unlike those commonly



used, being somewhat smaller at the bottom than at the top and having a grate *m* at its lower end.

The hot-air chamber D is cylindrical in form, is closed at the bottom, and open at the top. Its upper open end is fashioned with an outwardly-extending flange *n*, which rests upon the upper end of the inner case B. This flange *n* is provided at its periphery with a downwardly-extending ring *o*, which overlaps the upper portion of the circumferential wall of the inner case B and holds the said hot-air chamber concentric therewith.

A thimble *p* extends from the circumferential wall of the hot-air chamber D to that of the inner case B, thus bringing the hot-air chamber and the annular chamber surrounding it into communication. This is an important feature of my invention, for upon this construction largely depends the success of my invention.

The air-feed E (shown in place in Figs. 5 and 6 and detached in Fig. 9) is another important feature of my invention. It consists of a semicircular hollow casting, preferably V-shaped in cross-section, perforated on its concave side, having openings *q* therein and having lateral extensions *r* and *s* at either end. One of these extensions *r* is hollow and serves to supply air to the air-feed and through that to the combustion-chamber *l*. This hollow portion *r* extends out through the wall of the inner case B, the annular chamber surrounding the same, and the wall of the outer case A. The other laterally-extending portion *s* constitutes a lug by means of which it is secured to the circumferential wall of the inner case B.

The draft pipes or flues F consist of a horizontal section *t*, extending laterally from the upper portion of the inner case B, a similar section *u*, extending laterally from its lower portion, but not communicating therewith, and two vertical pipes *v* and *w*, connecting the said two horizontal sections *t* and *u*. One of these vertical pipes *v* is located between the inner case B and the outer case A, while the other one, *w*, is outside the outer case A. The upper horizontal section *t* is fashioned with an upwardly-extending thimble *x*, upon which is fitted the smoke-stack *y*, and is provided with a damper *z*, through the operation of which my stove or furnace is given a "direct" or an "indirect" draft.

I operate my stove or furnace as follows: I first start my fire in the fire-pot C by opening any one of the three doors and turning the damper *z* of the draft-pipes F "down," as shown by the dotted lines, (see Fig. 5)—that is, I open it—which gives my heater a direct draft, the smoke passing from the combustion-chamber *l* through the horizontal section *t* of the draft-pipes F and out through the smoke-stack *y*. When the fire is well started, I close the before-mentioned door and turn the damper *z* "up," as shown by solid lines, (again see Fig. 5)—that is, I close

it—which gives my heater an indirect draft, the smoke passing from the combustion-chamber *l* through a portion of the upper horizontal section *t*, thence downward through the incased vertical pipe *v*, thence through a portion of the lower horizontal section *u*, thence upward through the exposed vertical pipe *w*, thence through another portion of the upper horizontal section *t*, and out through the smoke-stack *y*.

The operation of my heater is as follows: The cold air from the floor is drawn in through the openings *c* of the base or bottom *b*, as shown by the arrows, thence upward through the annular chamber, (the space between the outer case A and the inner case B,) and thence a portion of it passes direct out through the openings *e* of the cap or top *d* to warm the room, while another portion passes through the thimble *p*, thus entering the hot-air chamber D, (where it is superheated by being directly over the combustion-chamber,) and thence reunites with the before-mentioned portion and with it escapes through the said openings *e* of cap or top *d*. Thus a constant circulation of air is maintained throughout the room, carefully-conducted experiments showing converging currents of cold air at the floor tending toward the heater, upward currents therefrom, diverging currents at the ceiling radial from a point above the heater, and downward currents at or near the walls of the room. It is noticeable that after closing the doors of the outer case A the air which maintains combustion must be supplied through the air-feed E. This air enters the feed E through the longitudinally-pierced lateral extension *r* and escapes into the combustion-chamber *l* through the perforations *q* in its concave side, and it is through this subdividing of the air and injecting it into the combustion-chamber *l* that the gas therein is ignited and consumed.

The advantages which I claim for my heater are, first, it is simple in construction, and therefore inexpensive; second, it is more durable than others, there being no plates that are not exposed to or in contact with the air; third, its system of draft-pipes is such that an almost perfect circulation of air is maintained in the manner above described, and, fourth, the manner of feeding combustion by means of superheated air taken in through the air-feed.

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

In a heating stove or furnace, the combination of an outer case, having its base or bottom plate provided with parts or passages through which the cold air may enter, and its cap or top having similar parts or passages through which the hot air may escape, and with doors for inserting fuel, and for withdrawing the ashes; an inner case resting upon and supported by the base or bottom plate of the said outer case; a fire-pot suspended in



the lower portion of the said inner case; a hot-air chamber having a closed bottom and an open top, suspended in the upper portion of the said inner case; a thimble, one end of which is affixed in the circumferential wall of the said hot-air chamber, and the other end of which is affixed in the circumferential wall of the said inner case, thus forming a passage between the interior of the said hot-air chamber and the annular chamber intermediate the said outer case and the said inner case; an air-feed supported within the said inner case, the intake or open end of which extends outward through the walls of the said inner and outer cases; and a direct and an indirect draft pipe system, a horizontal portion of which extends through the said outer case and communicates with the said inner case, another

horizontal portion of which extends through the said outer case, a vertical portion of which extends from the first-named horizontal portion to, and communicates with the last-named horizontal portion, said vertical portion being located within the said outer case and without the said inner case; a second vertical portion connecting the said horizontal portions, said vertical portion being without the said outer case; and a damper incased by the said first-named horizontal portion and intermediate the upper open ends of the said vertical portions, all substantially as shown and for the purposes specified.

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Witnesses:

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