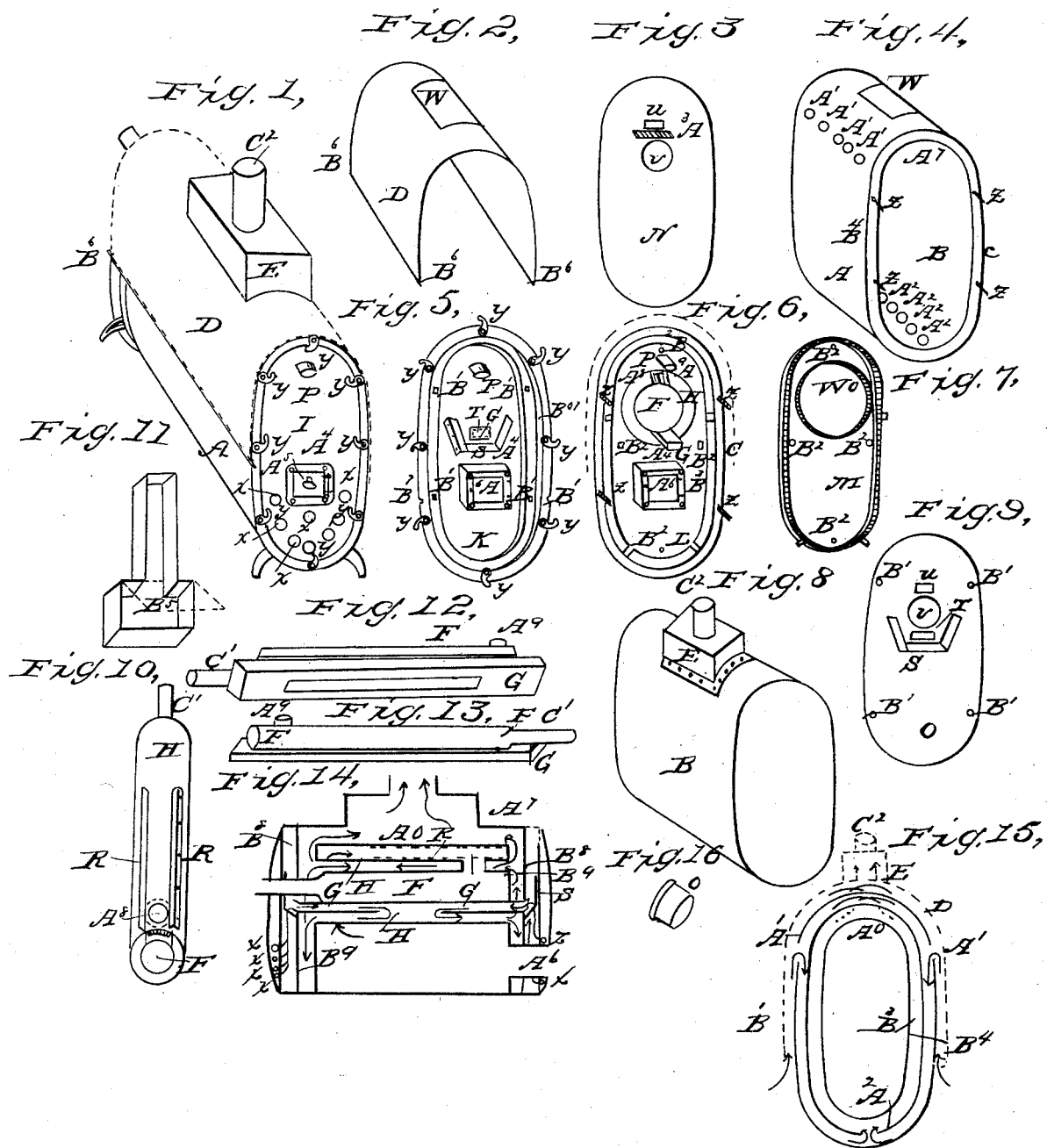


J. C. UNDERWOOD.

Heater.

No. 45,656.

Patented Dec. 27, 1864.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

JOHN C. UNDERWOOD, OF RICHMOND, INDIANA.

## IMPROVEMENT IN HEATERS.

Specification forming part of Letters Patent No. **45,656**, dated December 27, 1864; antedated December 3, 1862.

*To all whom it may concern:*

Be it known that I, JOHN C. UNDERWOOD, of the city of Richmond, county of Wayne, and State of Indiana, have invented new and useful Improvements in Heaters for Warming Buildings; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, the corresponding letters in the different figures having reference to the same parts.

The nature of my invention consists in constructing a heater with air-chambers surrounding a stove, in combination with air-chambers at the ends, with other arrangements herein-after explained, by which I obtain a large amount of heating-surface and also furnish pure air for inhalation.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

I construct my heater of sheet and cast iron, and secure the parts together by means of screw-rods and nuts, as most stoves are secured.

Figure 1 is a perspective view of my heater, in which A represents the outside casing of a double drum, as shown at A in Fig. 4. D represents an outside covering or jacket, with a hole cut in the top so as to allow it to pass over the air-chamber E, which may also be seen at E in Fig. 8; E, the air-chamber on top of the heater; C', the smoke-pipe, also seen at Figs. 10, 12, and 13; C<sup>2</sup>, the hot-air pipe; B<sup>6</sup> B<sup>6</sup>, projecting wires in the bottom of the jacket D, and on each side are designed to fit into the notches B<sup>7</sup> B<sup>7</sup> in the flange B<sup>01</sup>, as seen in Fig. 5. P is a small pipe to admit a scraper to clean out the stove at the top. This pipe is also seen at P in Figs. 5 and 6. J is the outside front plate, with a hole cut in it to slip over the pipe P, and also a hole cut in it so that it will slip over the projection A<sup>4</sup>, as seen in Figs. 5 and 6. *xxxxxxx* are holes cut in the lower end of the plate J to admit air. A<sup>4</sup> is the projection shown in Figs. 5 and 6, as seen after the front plate is adjusted to its place and secured by the buttons *yyyyyyyyy*, also shown in Fig. 5. A<sup>5</sup> is the door of stove.

Fig. 2 represents the outside covering or

jacket, D; W, the hole for the air-chamber, also seen in the drum at Fig. 4. B<sup>6</sup> B<sup>6</sup> B<sup>6</sup> B<sup>6</sup>, one of which is not seen, are the projecting wires in the two bottom edges.

Fig. 3: N is the outside back end plate of heater. (Not seen in Fig. 1.) U is an opening to receive the water-box. A<sup>3</sup> is a shelf to support the water-box. V is an opening through which the smoke-pipe passes.

Figure 4 is a double drum made solid at each end by inserting a piece of iron bent an oval shape between the two drums A and B, and securing them by riveting to B and turning the edges of A over the corners of the piece C at each end of the drum, leaving a chamber all round between A and B; A, the outside drum; B, the inside drum. A' A' A' A' A' are holes cut in the jacket A through the side near the top. An equal number (not shown) should be cut through the opposite side of the drum or jacket A, near the top, to correspond with those already described. A<sup>2</sup> A<sup>2</sup> A<sup>2</sup> A<sup>2</sup> A<sup>2</sup> are holes cut through the bottom of the drum B. C is the bent piece which fills the space between the two drums A and B, also seen at C in Fig. 6. Z Z Z Z are pins secured to the oval frame C, with threads cut on them to receive nuts, also shown at Z Z Z Z in Fig. 6. B<sup>4</sup> shows the chamber or space between the two drums, supposing the solid piece C not to be in. W is an opening in the drum A corresponding with the opening W in the jacket D in Fig. 2; A', the inside of the top of the drum B.

Fig. 5 represents the end of the heater with the front plate taken off. K is a second front end plate. B' B' B' B' are holes which slip over the pins Z Z Z Z shown in Figs. 4 and 6. B' B' B' B' also represent holes in the flange B<sup>01</sup>, which is slipped on the pins Z Z Z Z after the plate K and secured by nuts screwed on the pins Z Z Z Z. P is the pipe, as also shown in Figs. 1 and 6, and projecting through the plate K. T is a hole cut to admit the end of the conveyer G. (Shown in Figs. 12 and 13, and also seen projecting at G in Fig. 6. S is a flange formed by a level piece across at the bottom with its sides flaring out at the top, so that the air in rising has to pass around it before it enters the tube or conveyer G, as shown by the dotted lines at G in Fig. 5. B<sup>01</sup>

is the flange made with a recess so as to form a chamber between the plates K and J. *y y y y y y y y* are buttons secured to the front part of the outer edge of the flange by bolts or rivets, so that they will turn, by which means the plate J is secured to the flange B<sup>01</sup>. B<sup>7</sup> B<sup>7</sup> are the two notches or recesses in the outer edge of the flange. There is two of these flanges necessary—one to be secured to the front end and one to the back end of the heater. They should be constructed alike. The plate K should have a hole cut through it to slip over the projection A<sup>4</sup>, as seen projecting from the front plate of the stove at A<sup>4</sup> in Fig. 6. A<sup>6</sup> is the opening with the door off.

Fig. 6, letter L represents the front plate of the stove. A<sup>4</sup> represents the projection to which the door is hung, as seen at Fig. 1, and also at Fig. 5. This projection is cast solid onto the front plate. G is the conveyer-pipe projecting from the under side of the smoke-pipe F. F is the large end of the smoke-pipe, as hung to the upper side of the inside of the drum H, by slipping the collar A<sup>9</sup> on the collar A<sup>8</sup>, which may be seen at Figs. 10, 12, and 13. H is an air-chamber surrounding the smoke-pipe F. P is the pipe, before referred to, for access in cleaning the soot from the top of the stove. B<sup>2</sup> B<sup>2</sup> B<sup>2</sup> B<sup>2</sup> are holes in the front plate of the stove for rods to pass through to secure the front and back plate to the drum forming the stove. Z Z Z Z are screws, also seen in Fig. 4, their purpose having already been explained. D is the outer jacket, also shown in Figs. 1, 2, and 15. B<sup>3</sup> is an air-chamber between the stove and the inside of the double drum, as represented in Fig. 4.

Fig. 6 represents the end of the stove standing inside of the double drum represented by Fig. 4, and also showing the end of the jacket D.

Fig. 7 represents the inside of the back plate of the stove, with a flange around the plate near the edge and a flange around the opening W<sup>0</sup>. The inside of this corresponds with the inside of the front plate, except that the back has no projection or opening for a door. It is simply made flat, as seen in Fig. 7. M is the plate; W<sup>0</sup>, an opening. B<sup>2</sup> B<sup>2</sup> B<sup>2</sup> B<sup>2</sup> are holes, as also shown in Fig. 6. The stove is made by forming a piece of sheet-iron, an oval shape of the proper size to fit the flanges in the edges of the front and back stove-plates and by forming a round cylinder to fit the flanges around the openings, as represented at W<sup>0</sup>, the flanges supporting the sheet-iron. They are screwed together by rods passed through the holes B<sup>2</sup> B<sup>2</sup> B<sup>2</sup> B<sup>2</sup>, as seen in Figs. 6 and 7.

Fig. 8, letter B shows the inside casing of the double drum, as represented at B in Fig. 4, with the air chamber E riveted onto the top. There should be an opening cut at the top of the casing B so as to leave free communication between it and the air-chamber E. All the drums, after being formed, may be either grooved or riveted.

Fig. 9, O represents the inside back plate; U, an opening for water-box. V is a round opening for smoke-pipe; T, an oblong opening for the end of the air-conveyer. S is a flange riveted; on B' B' B' B', the holes all referred to in the description of plate K, in Fig. 5.

Fig. 10, H represents a round cylinder with a collar riveted around a hole cut in the top side and corresponding with a collar on the upper side of the smoke-pipe F, which is seen passed through the cylinder H at C'. On each side of the smoke-opening at A<sup>8</sup>, on the cylinder, are riveted two pieces, R R, made of sheet-iron, extending in length back about two-thirds the length of the cylinder, and wide enough to reach up from the cylinder, to which they are riveted, to the inside of the top of the stove.

Fig. 11 represents the water trough or box; I, the box; B<sup>5</sup>, the lid. (Represented by dotted lines.)

Fig. 12 is the smoke-pipe with the air-conveyer G attached to its bottom side. F is the large end of the smoke-pipe; C', open end of stove-pipe or smoke pipe. A<sup>9</sup> is a collar on the smoke-pipe. This figure represents the smoke-pipe and air-conveyer G as lying on their side.

Fig. 13 represents Fig. 12 as lying right-side up; F, the large part of the smoke-pipe; A<sup>9</sup>, the collar; C', the small or open end of smoke-pipe; G, the air-conveyer.

Fig. 14 is a section as cut in two, lengthwise, showing the air-chambers, with arrows at the ends of heater, the arrows indicating the course of the air in the end chambers as it passes into the chambers surrounding the stove. The letters of reference in this figure indicate parts heretofore explained, except B<sup>3</sup> the outside end chamber, and B<sup>9</sup>, the inside one.

Fig. 15 is a section showing the heater cut in two, crosswise, showing the air chambers which surround the stove, the direction of the air being indicated by the arrows; the parts in this figure marked by the letters of reference having been heretofore explained, except the space between the out side jacket and the double drum. (Seen at B<sup>10</sup>, also A<sup>0</sup>, which shows the inside of the top of stove.)

Operation: It will be seen by heating the stove heat is communicated to the air as it is passed in at each side under the jacket D, and passes up the chamber B<sup>10</sup> into the holes A' A' A' A', and passes down the chamber B<sup>4</sup> on each side, and up through the holes A<sup>2</sup> A<sup>2</sup> A<sup>2</sup> A<sup>2</sup> into chamber B<sup>3</sup>, and, passing up each side of the stove, is received in the chamber E. While the air is received through the holes x x x x x x x into the outer air-chambers at the ends of the heater it is passed through the conveyer G, half way along (from each end) inside the cylinder H, when it is passed along the bottom and out at each end of cylinder H, and mingles with the air in the surrounding chambers, and is passed off and

conveyed to parts of the building by attaching a pipe to the top of air-chamber E.

I do not claim the invention of heaters, as they have long been known and used; but

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

1. The plate J and plate K, in combination with the flange S and holes *xxxxxxx*, substantially as described.

2. I do not claim any novelty in passing an air-flue through a hot-air chamber; but what I do claim is the air-chamber H and smoke-pipe F, in combination with the air-conveyer G, all arranged, constructed, and operated substantially as described.

3. The air chambers or passages B<sup>8</sup> and B<sup>9</sup>, in combination with air-conveyer G, all being arranged, constructed, and operated substantially as described.

4. The air chamber or space B<sup>4</sup>, in connection with the space B<sup>10</sup> and chamber B<sup>3</sup>, all in combination with the holes A' A' A' A' A', and A<sup>2</sup> A<sup>2</sup> A<sup>2</sup> A<sup>2</sup> A<sup>2</sup>, all being arranged, constructed, and operated substantially as above described.

JNO. C. UNDERWOOD.

Witnesses:

JOHN FINLEY,  
THOS. A. DUGDALE.