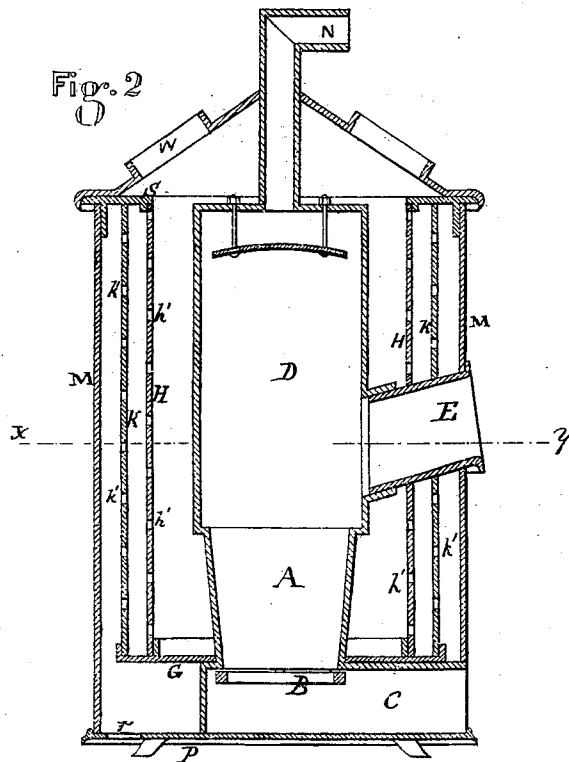
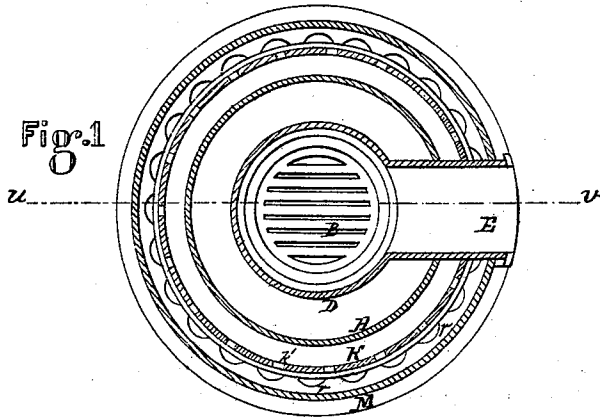


M. H. ROBERTS.
Hot-Air Furnaces.

No. 148,324.

Patented March 10, 1874.



Witnesses { John F. Grant
 Park M. Farland, Jr.

Matthew H. Roberts
 per Edw. Brown
 Attorney

UNITED STATES PATENT OFFICE.

MATTHEW H. ROBERTS, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. **148,324**, dated March 10, 1874; application filed February 9, 1874.

To all whom it may concern:

Be it known that I, MATTHEW H. ROBERTS, of 1210 Market street, Philadelphia, Pennsylvania, have invented certain Improvements in Heaters, of which the following is a specification:

My invention consists in the arrangement of two or more sheet-iron casings around the heater, having openings or perforations for the admission of air, so arranged that the perforations in one casing are opposite the blank space in the next casing, thus preventing the rays of heat from the heating-drum from striking the exterior blank casing, and accomplishing other valuable results. The objects of my invention are to prevent the radiation of heat from the heater into the cellar, and to warm the air which enters to a higher temperature with less consumption of fuel than heretofore attained.

To accomplish this, I inclose the heater in three sheet-iron cases. The annular air-space between the inner cases is closed at the top and bottom. The space between the two outer cases is closed at the top only. The bottom is open for the admission of cold air. The two inner cases are perforated with holes about six inches distant from each other, and the apertures in the middle case are placed in a position intermediate between the openings through the inner case.

By this construction, the air which enters at the bottom between the two outer cases is drawn in through the perforations in the second case, impinging against the blank wall of the inner casing, where it receives additional heat, and again finds its way through the holes in the interior case to contact with the cylinder or fire-pot. The position of the perforations, as described, also prevents the rays of heat from the fire-pot from striking the outer casing.

In the drawing, Figure 1 is a section through the heater on the line *xy*. Fig. 2 is a vertical section through the heater on the line *uv*.

A is the fire-pot; B, the grate; C, the ash-pit; D, the wrought-iron heating-drum; E, the feeder-neck, by which coals are admitted to the fire. Just at the level of the top of the ash-pit is a plate, G, upon which stands the inner casing H, perforated with holes *h'*, about six inches apart; another casing, K, stands

upon the plate G, at the distance of two or three inches. This also is perforated with holes *h'*, which are placed in a position intermediate between the holes in the interior case, as shown in Fig. 2. An exterior case, M, is placed outside the case K. The ash-pit C is closed, so that the air which enters it has no access to the interior of the casings, but passes upward through the fire, and out through the smoke-pipe N. The plate G prevents the cold air entering the two inner cases at the bottom, and both the annular air-spaces between the cases M K H are closed at the top by the ring S, so that the cold air which enters through the bottom plate, at *r*, passes upward between the casings M and K, and is drawn in through the openings *h'*, impinging against the blank wall of the casing H, whence it is drawn through openings *h'*, impinging upon the fire-pot and drum, and having become heated passes out at the pipes W to the rooms above. By this arrangement the air passes through in divided streams, and is warmed gradually by an impinging contact upon surfaces moderately heated, and with an increasing heat as it approaches the fire-pot and drum, so that it will leave the heater at a high temperature without any necessity of being scorched by contact with a red-hot cylinder. The relative position of the holes in the two casings H and K is such as to prevent the direct radiation from the drum D from striking the outside casing, which, consequently, remains quite cool. These casings also act as a reservoir of heat, so that when the stove is cooled off by putting on fresh coal, the air still continues to be partially warmed, and cold drafts are avoided.

I am aware that the use of several casings to prevent radiation is not new, and I make no such broad claim.

I claim—

In a heater, the combination of the outer casing M and two or more perforated casings, H K, having the perforations *h'* in one casing arranged opposite the blank space of the next interior case, as and for the purpose herein described.

MATTHEW H. ROBERTS.

Witnesses:

EDWD. BROWN,
JOHN F. GRANT.