(No Model.)

C. E. WYMAN.

FURNACE.

No. 557,469. Patented Mar. 31, 1896.

Fig. 2.

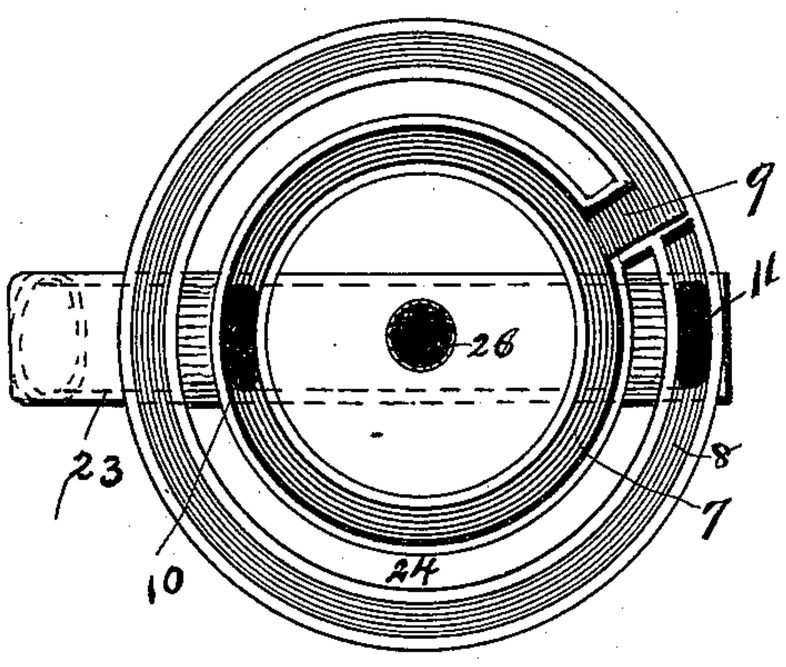


Fig. 3.

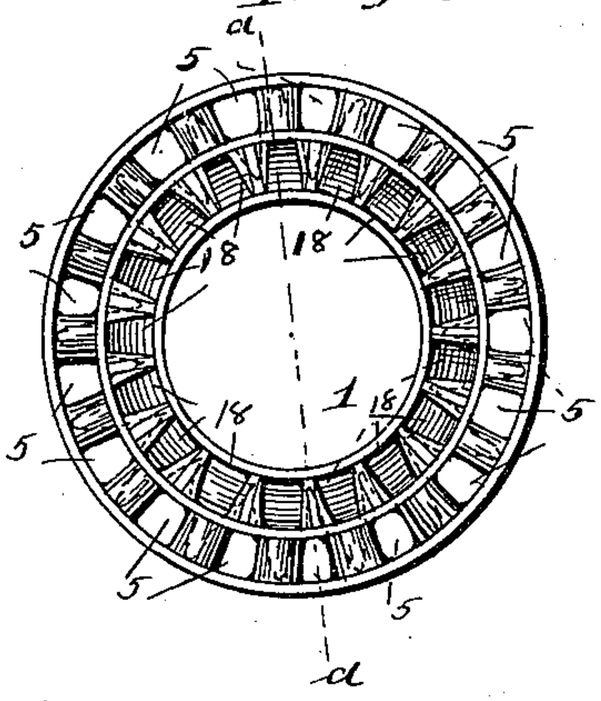


Fig. 1

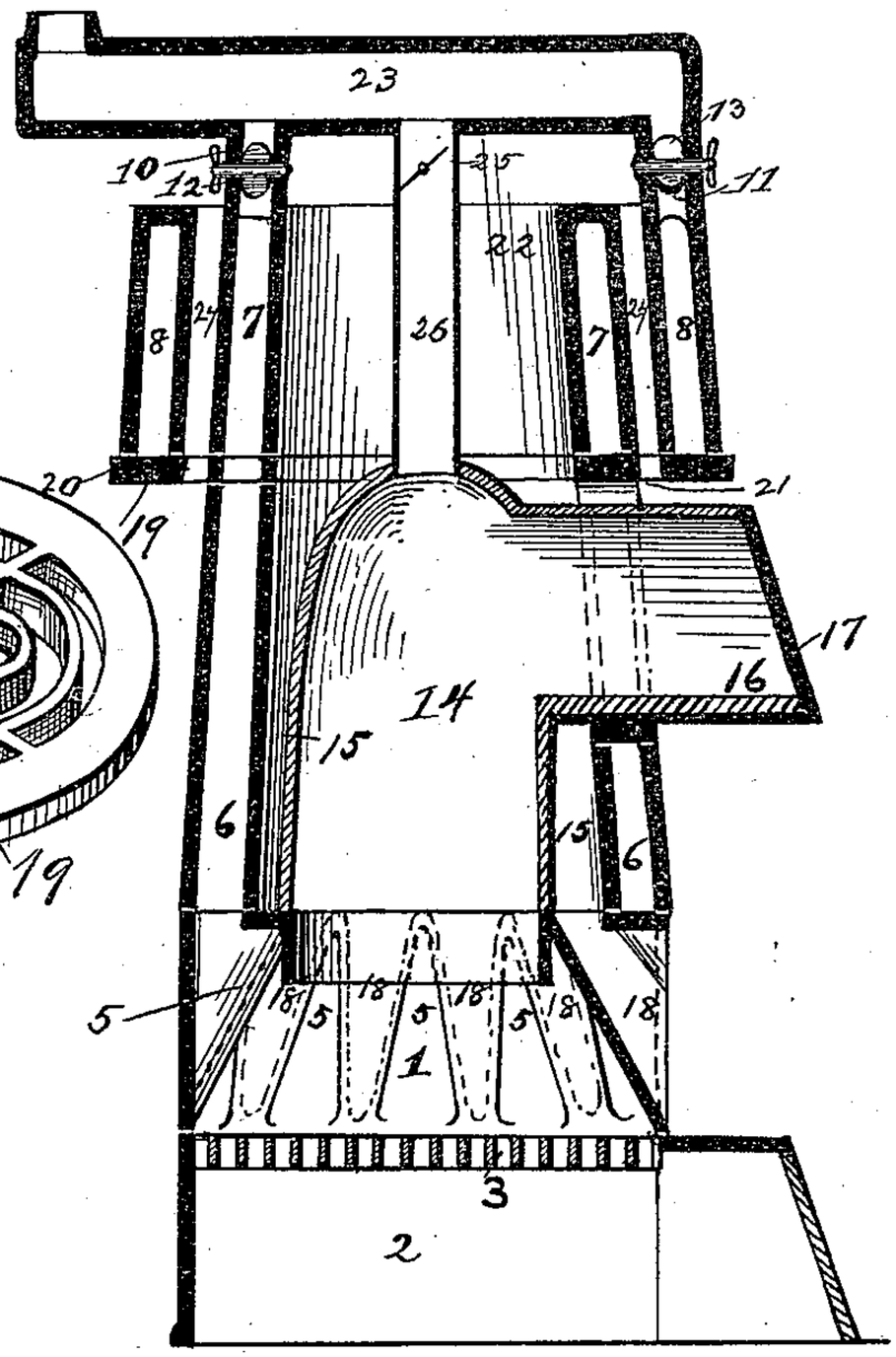
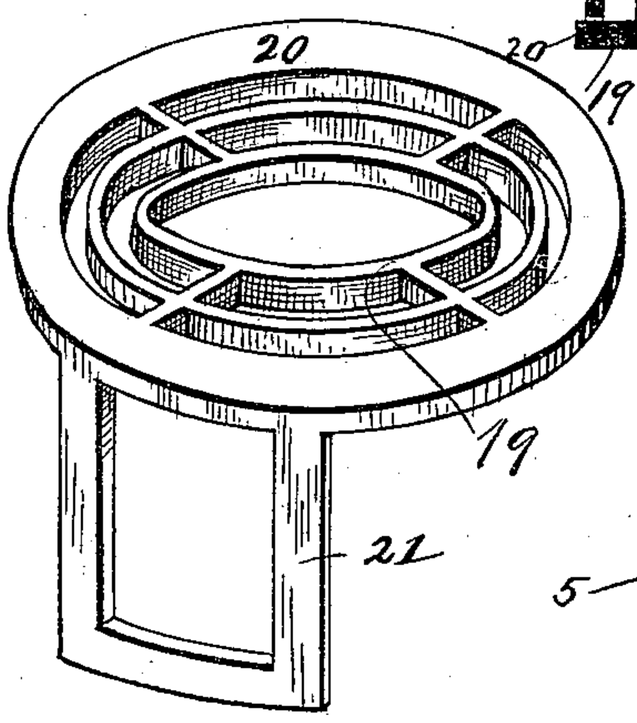


Fig. 4.



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FURNACE.

SPECIFICATION forming part of Letters Patent No. 557,469, dated March 31, 1896.

Application filed July 18, 1895. Serial No. 556,377. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. WYMAN, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, State of Ohio, have invented certain new and useful Improvements in Furnaces, of which I hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in furnaces; and the objects of the invention are to provide additional radiating-surfaces for heat, to consume the smoke and other products of combustion, and to so arrange the supply of fuel relatively to the grate-surface as to prevent explosions from sudden development of gas.

My invention consists in the annular chambers and peculiar form of fire-pot and of magazine, as hereinafter described, shown in the accompanying drawings, and more specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical central section on line *a a*, Fig. 3. Fig. 2 is a view from the under side of the upper portion of the furnace, showing annular heating and smoke flues. Fig. 3 is a plan view of the fire-pot. Fig. 4 is a detail view of the disk separating the body of the furnace from the upper smoke-box.

In the drawings, 1 is the fire-pot, resting upon the ash-pot 2, which is provided with the grate 3 beneath the fire-pot. The fire-pot 1 contains a central open receptacle, from which open flues 5 for the products of combustion, arranged annularly about the circumference. These flues open vertically into an annular chamber 6, which forms the exterior of the body of the furnace, and the chamber is continued upward into the smoke-box 7, which, to increase the radiating-surface, is provided with an additional annular chamber 8 and a radial flue 9, connecting the two chambers. Both inner and outer chambers have connecting-flues at 10 and 11 with a single smoke-pipe 23, and by turning the dampers 12 or 13 connecting each chamber, respectively, with the pipe the smoke can be admitted direct to the pipe or through the second chamber before reaching the pipe.

14 is the magazine for fuel, which rests upon the fire-box at the inner edge of the encircling wall, leaving an annular chamber 15 between its wall and the inner wall of the body of the furnace. The mouth of the magazine opens outward at 16, and a door 17 prevents fumes from the heated coal from escaping outward.

Alternating with the smoke-flues 5 and in close juxtaposition therewith in the wall of the fire-pot are the cold-air passages 18, which, after traversing the wall diagonally, enter the annular chamber 15.

19 is a disk placed between the smoke-box and furnace-body, pierced to continue the inner fresh-air chamber and the inner annular smoke-chamber, and forming the bottom for the outer smoke-chamber at 20, and provided with the depending loop 21, which encircles the magazine.

The inner air-chamber is entirely open above the magazine-roof for free passage of the air at 22.

It will be seen from the drawings that a greatly-increased surface for heat-radiation is obtained. All cold air entering the furnace above the grate passes through the wall of the fire-box, between the flues which carry away the smoke and other products of combustion, and thus becomes exceedingly hot at the outset; thence it surrounds the magazine and imparts some heat thereto, and finally escapes through the central opening above the furnace, after also acquiring heat from the interior walls of the furnace-body and smoke-box. The air entering through the grate and mixing with the products of combustion passes through the flues encircling the fire-box into the annular chamber of the furnace-body, which thus presents two surfaces for radiation, and the smoke-box having two annular chambers separated by the annular opening 24 presents four surfaces for radiation of heat to the outer air.

The diagonal hot-air flues and cold-air passages entering the fire-box narrow the upper opening where the magazine rests upon the fire-box, the result of which is to insure the deposit of fuel centrally upon the grate, whence it spreads gradually as it is consumed. A large portion of the coal in the magazine is coked before it falls upon the grate, thus

preventing danger of explosion from gases confined under a large surface deposit of coal, since the gases will ignite as fast as made.

A further advantage of my invention is found in the low position of the smoke-exit in the fire-box, which compels the smoke to pass through a hot blaze before entering the flues, thus consuming it, or such of it as remains after roasting in the magazine.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a furnace, the combination with a vertical fire-pot provided with a reduced upper opening, of a closed annular chamber forming the body of the furnace resting upon the said fire-pot, a fuel-magazine resting upon the fire-pot, and covering said opening and separated from the body of the furnace by an annular chamber open above, flues entering the outer annular chamber from the fire-pot and fresh-air passages entering inner annular chamber from the outer air, through the wall of the fire-pot, and a smoke-flue connecting with said outer chamber, substantially as set forth.

2. In a furnace, means for providing increased surface for radiation, consisting in, a vertical fuel-magazine, closed outer and open inner annular chambers about said magazine, a fire-pot communicating with said magazine and located vertically underneath the same, flues entering the wall of the fire-pot diagonally, and connecting the fire-pot and outer chamber and fresh-air passages connecting the inner chamber with outer air, also entering said wall in combination with a grate and ash-box beneath the fire-box and outer passage to the fuel-magazine, substantially as described.

3. In a furnace, the combination with a vertical fire-pot provided with a narrowed upper opening and hot-air flues and cold-air passages in the wall thereof arranged in close juxtaposition, of a covered magazine resting upon the fire-pot, an annular chamber resting upon the wall of the fire-pot, communicating with the said hot-air flues, an inner open chamber connecting with the said cold-air passages, a perforated disk resting upon the walls of said chambers provided with a depending loop, a horizontal outward extension of the magazine, encircled by said loop, and annular smoke-chambers resting upon said disk, substantially as described.

4. In a furnace, a fire-pot provided with a narrowed upper opening, and hot-air flues passing through its walls alternating with cold-air passages, in combination with a fuel-magazine mounted centrally above said narrowed opening, whereby a downdraft is secured over the fuel-surface, substantially as described.

5. In a furnace the combination with a vertically-arranged fire-pot provided with a narrowed upper opening and alternating cold-air passages and hot-air flues passing through its walls of a covered magazine mounted upon the fire-pot over the narrowed opening, and a grate underneath said fire-pot, substantially as set forth.

6. In a furnace, a vertically-arranged fire-pot, provided with an upper central narrowed opening, and hot-air flues extending through its walls opening into the fire-pot near its base, and alternating with cold-air passages whereby increased radiation of heat is obtained, substantially as and in the manner described.

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