

J. V. MATHIVET.
Hot-Air Furnaces.

No. 151,894.

Patented June 9, 1874.

Fig. 1.

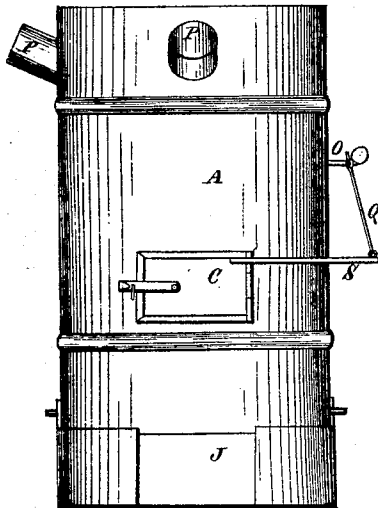


Fig. 2.

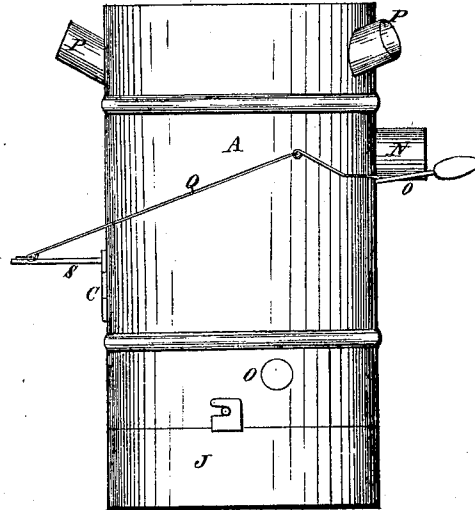


Fig. 3.

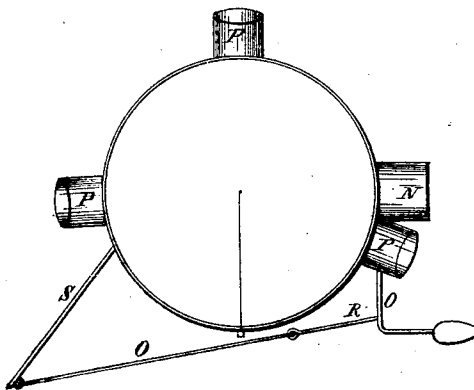
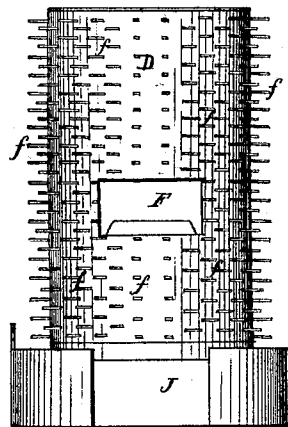


Fig. 4.



Witnesses.

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Fig. 5.

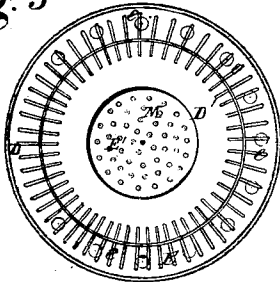


Fig. 6.

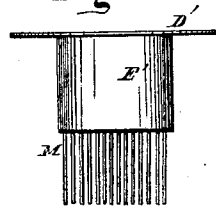


Fig. 7.

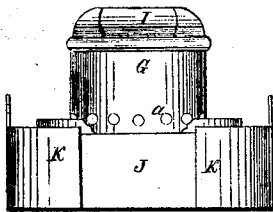


Fig. 8.

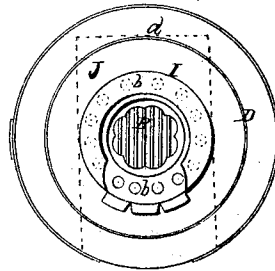
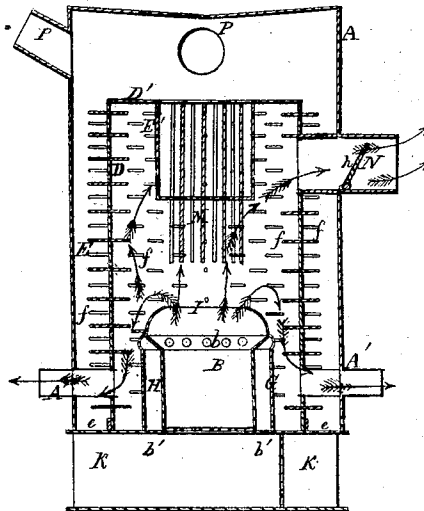


Fig. 9.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. **151,894**, dated June 9, 1874; application filed May 12, 1874.

To all whom it may concern:

Be it known that I, JEAN V. MATHIVET, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Furnaces, of which the following is a full and complete description, reference being had to the accompanying drawings, making a part of this specification, of which—

Figures 1 and 2 are side elevations of the furnace. Fig. 3 is a plan view. Figs. 4, 5, 6, 7, and 8 are detached sections. Fig. 9 is a transverse vertical section.

Like letters of reference refer to like parts in the several views.

The nature of this invention relates to a heating-furnace for dwellings, &c.; and the object whereof is to provide said furnace with a large heating-surface or radiators, whereby the heating capacity of the furnace is greatly increased.

Of the construction of said furnace, and the operation of the same, the following is a full and complete description.

In the drawings, A represents the case or shell of the furnace, which is of a cylindrical form, as shown. Within, at the base of said shell, is the fire place or pot B, Fig. 9, access to which is had from the outside, through the door C, Fig. 1. A detached view of the furnace is shown in Fig. 7, of which Fig. 8 is an inside view from the top. Surrounding said fire-place is a cylinder, D, Fig. 8, between which and the shell A is formed thereby an annular air-chamber, E. A detached view of the cylinder D is shown in Fig. 4. Access is had to the fire-place B, inclosed by the cylinder, through the door F, directly opposite the door C of the shell. Immediately surrounding the fire-place is a cylinder, G, Fig. 9, between which and the fire-place is an annular chamber, H, put in communication with the inside of cylinder D, by a series of holes, *a*, Fig. 7, made around the base of the cylinder G, as shown in said figure referred to. The annular chamber referred to opens into the cylinder D from its top through a range of openings or holes, *b*, directly around the rim of the fire-pot. The holes are covered by a circular hood or deflector, I, projecting over, a little above them, as shown in Fig. 9. On

each side of the ash-pit J is a chamber, K, Fig. 9. Said chambers are put in communication with the annular air-chamber E by a series of holes, *e*, Fig. 5. Access is had to the chambers K by a door corresponding to the door J of the ash-pit, made in the opposite side of the base of the furnace. The ash-pit does not extend entirely across the bottom of the furnace, but stops short of the back side thereof, as indicated by the dotted lines *d*, Fig. 8, thereby allowing room between the end of the ash-pit and side of the base of the furnace for a doorway, to obtain access to the side chambers K referred to. The top of the cylinder D is closed air-tight by the cap D', Fig. 6, which represents a detached view of the cap. The bottom thereof is also secured to the base in an air-tight manner, so that smoke, &c., may not find its way from the inside of the cylinder into the air-chamber E. The top or cap D' referred to is provided with a tubular body, E', which descends down into the cylinder some distance, as seen in Fig. 9. Said body forms a chamber, through the bottom of which is passed a number of rods or radiators, M, Fig. 6. The lower ends of the rods descend below the bottom of the body, to within a short distance of the fire-place, whereas their upper ends reach to the top thereof, as shown in Fig. 9. The entire body of the cylinder D is studded with short rods or radiators, *f*, as shown in Figs. 4 and 9, in which it will be seen that the rods pass entirely through the sides of the cylinder, so that the inside as well as the outside thereof bristles with points or radiators.

The practical operation of the above-described furnace is as follows: The fire on being kindled, the smoke, &c., pass off therefrom through the cylinder D, and out at the pipe or flue N, Fig. 9, as indicated by the arrows.

It will be obvious that the heat, &c., circulate around about the body E' of the cap D', and also about the rods M projecting down therefrom; also around about the salient ends of the rods *f* projecting from the sides of the cylinder D. The heat of the furnace is transmitted to the air-chamber E by the numerous conducting-rods, as well as by the sides of the cylinder itself, thereby heating the air

therein, by a large amount of heating and radiating points of transmission, which soon raises the air in the chamber E to a high degree of temperature. Air from the outside is supplied to the chamber through the holes *e*, Figs. 5 and 7, in the bottom of the chamber, the air passing therein from the side chambers K, referred to from the outside. Fresh air is also supplied to the fire directly at the top of the fire-pot through the holes *b*, around the mouth or rim thereof, from the air-chamber H, and which is deflected over onto the furnace by the hood or deflector I, thereby causing it to mingle directly with the flame and smoke at the top of the fire, in order to consume the smoke, and to obtain a more perfect combustion of the fuel. Air is admitted into the chamber H through the series of holes *a*, Fig. 7, around its base, and also through the bottom thereof from the ash-pit. Said holes also serve to allow any ashes or dirt that may find its way in from the top in feeding the furnace to pass out through the bottom, and thereby offer no obstruction to the draft. The heated air in the chamber E is conducted therefrom through the eduction-pipes P, in which pipes may be arranged valves to govern the flow of the air therefrom. In the smoke-pipe N is a valve, *h*, Fig. 9, opened by a weighted arm, O. Said valve is closed by the door C, to which it is attached by a cord, Q. One end of the cord is secured to an arm, R, connected to the valve-stem, and the other end is connected to an arm, S, projecting from the door C, referred to. Now, on opening the door, the cord is slackened, and the weighted arm closes the valve. On closing the door the cord draws on the arm of the valve and closes it. The purpose of the valve is to divert the direction of the smoke,

&c., from its direct escape through the eduction flue or pipe N, and cause it to pass down around the chamber H, and escape from the cylinder D at its lower end, instead of at its top, through the smoke or eduction pipes A', which pass from the outside through the air-chamber E into the cylinder D. The direction of the smoke is as indicated by the inverted arrows in Fig. 9. This will be the general direction for the escape of the smoke; but when the draft is weakened by opening the furnace-door, the valve in the pipe N is opened at the same time to allow the sluggish smoke to escape more directly from the heater, and thereby prevent the furnace from smoking.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The annular chamber H, having openings at *a*, *b*, and *b'*, in combination with the hood or deflector I and cylinder D, substantially in the manner as described, and for the purpose set forth.

2. The top plate D', having a chamber, E', and conducting-rods M extending into and below said chamber to the fire-place, in combination with the cylinder D, having conductors *f* at the outside and inside of said cylinder D and case A, substantially as and for the purpose specified.

3. In furnaces, the top plate D', having attached thereto a chamber or body, E', provided with conductors M, as described, in combination with the cylinder D, provided with conductors *f*, substantially as and for the purpose specified.

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Witnesses:

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A. F. CORNELL.