

(No Model.)

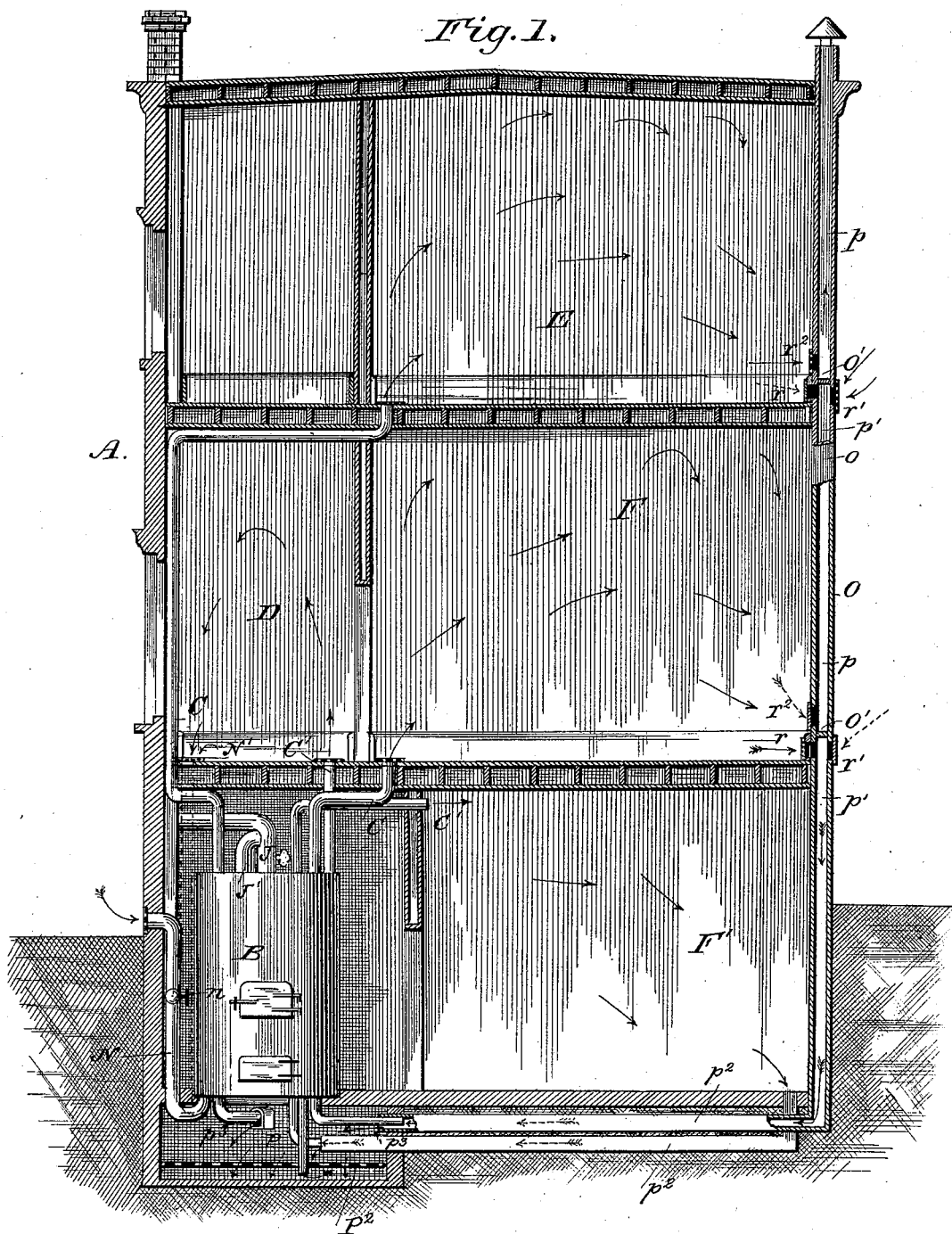
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METHOD OF AND APPARATUS FOR HEATING AND VENTILATING BUILDINGS.

No. 306,638.

Patented Oct. 14, 1884.



WITNESSES:

*Wm. L. Dieterich*  
*A. G. Loeper*

INVENTOR.

*I. J. Ordway*  
*24 Munn & Co*  
ATTORNEYS.

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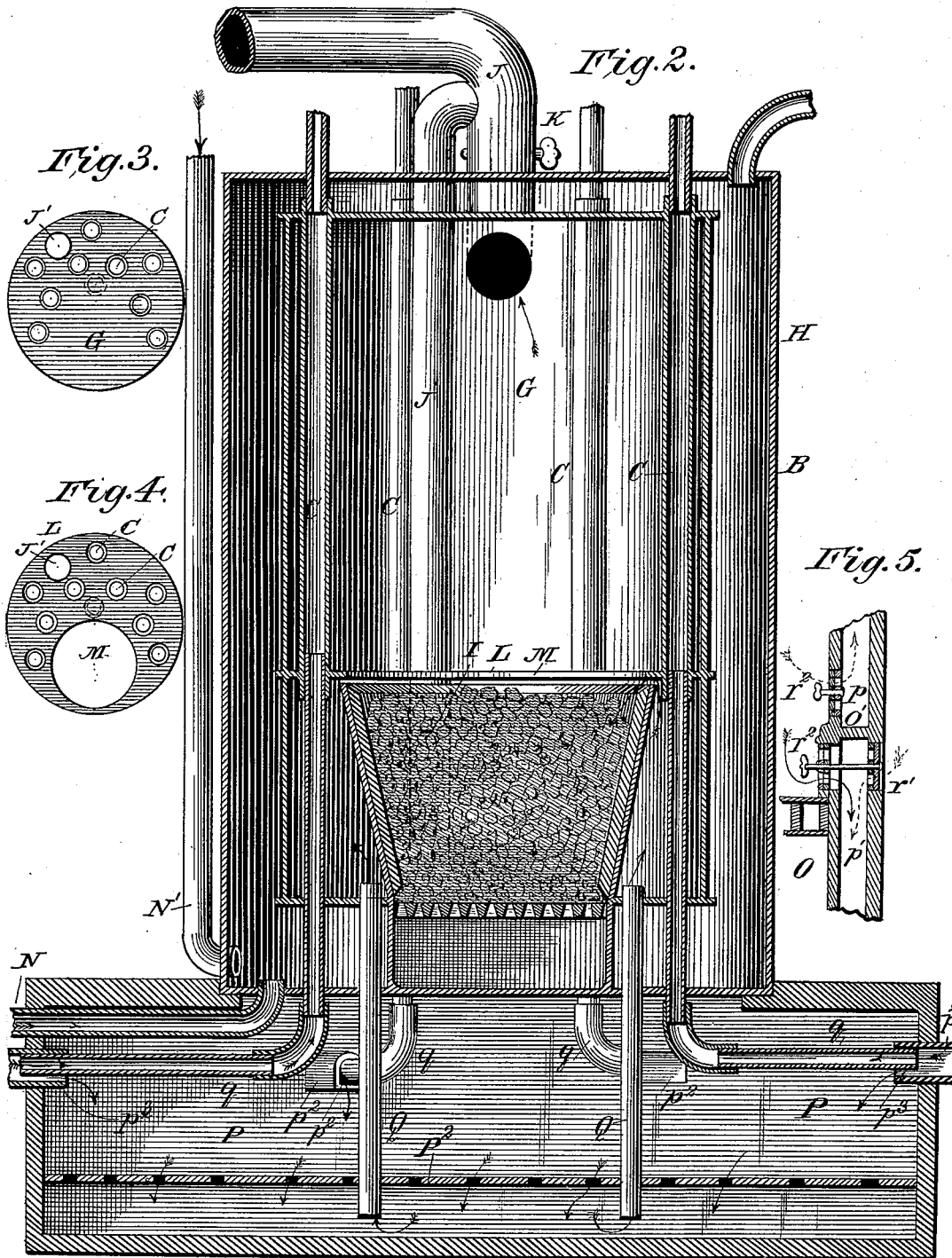
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*by Munn & Co*

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# UNITED STATES PATENT OFFICE.

IRA JAMES ORDWAY, OF CHICAGO, ILLINOIS.

METHOD OF AND APPARATUS FOR HEATING AND VENTILATING BUILDINGS.

SPECIFICATION forming part of Letters Patent No. 306,638, dated October 14, 1884.

Application filed February 12, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, IRA JAMES ORDWAY, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Heating and Ventilating Buildings, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, forming part of this specification.

10 This invention has for its object to provide a system of heating and ventilating buildings by heated air, whereby the impurities of the heated and breathed air may be eliminated therefrom and the surplus heat of said air be  
15 economized by returning the partially-cooled air to the heater to be reheated; or, instead of purifying and reheating the used air, it may be allowed to escape and cold fresh air from without may be supplied to the heater, at the will  
20 of the occupants of the house, according to the degree of heat required.

The invention has also for its object to insulate the circulated heating-air of each room of a house from that of every other room, instead of supplying each room with air from a  
25 common drum or reservoir, which is replenished with air returned from the several rooms of the house, as is ordinarily done where a complete circulation of air is employed. Each  
30 room is accordingly provided with a complete and independent heating apparatus, which has nothing in common with that of another room, except the heating-furnace through which the air-flues lead and to which the elimi-  
35 nated impurities of the reheated air are fed, and each apparatus is provided with a number of inlet and outlet registers located in its proper room or within easy reach of the occupant thereof, so that the heating and ventila-  
40 tion of said room may be effected, at the will of its occupant, by a continuous circulation of reheated air, or by the passage of separately-heated fresh air, or by the combined effect of both.

45 The novel features of my invention will be more particularly pointed out in the claims hereinafter set forth.

In the drawings, Figure 1 is a vertical section of a house, showing my system of heating and  
50 ventilating buildings. Fig. 2 is a vertical section of the furnace. Figs. 3 and 4 are detail

views of parts of the furnace, and Fig. 5 is a detail view showing the arrangement of the registers.

A indicates a house, in the basement of  
55 which is located a furnace, B, through which pass air-flues C, leading to the rooms E F. The flues C are entirely separate from each other, and are supported in the heads of the inner and outer drums, G H, of the furnace. 60 The inner drum, G, supports the fire-pot I, and communicates at its upper end with a pipe, J, leading to the smoke-flue, which pipe is provided with a branch, J', extending down near the bottom of the drum G at one side of  
65 the fire-pot as a means of retarding the draft when a damper, K, in the pipe J is closed. The draft is still further retarded in such case by a diaphragm, L, located just above the  
70 plane of the upper edge of the fire-pot, and provided with an opening, M, to allow the heat and products of combustion to pass up into the upper part of the drum before escap-  
75 ing through the pipe J', which extends below the diaphragm.

Fig. 3 shows a plan view of the upper head of the drum G. The outer drum, H, serves as a jacket for protecting the inner drum from the cooling effect of the outer air, and it also serves as a chamber for receiving air from  
80 pipes N N' to support combustion. The air in the drum H becomes partially heated by its contact with the drum G, and it may be utilized for mildly heating a hall-room, D, or basement-room, F', by means of the flues C'. 85

The flues C are to be supplied with air by means of flues O, located or formed in or near the wall of the house, and extending from the roof to the basement. The flues O, which are to be arranged alongside of each other in po-  
90 sition for communicating with their respective rooms, are each provided with a partition, O', near the floor of its proper room, which partition divides the flue into an upper part,  $p$ , for ventilation, and a lower part,  $p'$ ,  
95 which communicates with a horizontal flue,  $p^2$ , under or in the floor of the basement. The flue  $p^2$  leads into a foul-air chamber, P, located under the furnace, and it connects with a flue, C, by a pipe,  $q$ , which is smaller in diameter  
100 than the flue  $p^2$ , and which is to be supported in the upper concavity of said flue to provide

a passage,  $p^3$ , through which the heavier impurities of the air passing along the flue  $p^2$  may leak into the foul-air chamber, and thus be eliminated from the purer air which passes into the flue C. Each flue O is provided with a register,  $r$ , communicating with its proper room below the partition O', and a register,  $r'$ , also below said partition, communicating with the outside air, while a register,  $r^2$ , located above the partition O', provides a passage from the room to the ventilating-shaft  $p$ .

With the above construction, by closing the registers  $r'$   $r^2$  and opening the register  $r$ , as in room F, a complete and continuous circulation of the heated air entering the room will be produced, as indicated by the arrows. If the register  $r$  is closed and the registers  $r'$   $r^2$  are opened, as in room E, the heated air entering the room will pass up the ventilating-shaft  $p$ , while cold fresh air from outside the house will enter the flue  $p'$  and supply the flue C. In the first case greater heat will be produced, owing to the economizing of the heat, by the continuous circulation of the air; in the second case a less degree of heat will be produced, owing to the greater coldness of the air supplying the flues C, and either method of supplying air to the flues C may be employed, at the will of the occupants of each room so constructed, according to the degree of heat required, and without interfering with the proper ventilation of the room; or both methods may be combined by partially opening all the registers, where an intermediate degree of heat is required.

The room D, being directly over the furnace, is provided with a return-flue, N', passing down through its floor, as shown in dotted lines, and is therefore adapted for using only circulated hot air. As the flue N' opens into the drum H near its bottom, it serves also to supply air to support combustion, and if the cock  $n$  in the pipe N is closed, so that the flue N' shall be the chief source for supplying air to support combustion, a slower draft may thereby be secured when required. The pipe C', supplying hot air to room D, is fed from the drum H like the pipe C, leading to the basement-room F'. The room F' may likewise return its air to the drum H in a direct way, or it may be returned through a flue,  $p^2$ , and pipe  $g$ , having a leak-passage,  $p^3$ , into the foul-air chamber P.

The foul-air chamber is provided with a false bottom,  $P^2$ , below which the heavier impurities will sink and be protected from agitation by currents of air entering through the leak-passages, and from which they will rise through the escape-pipes Q, leading to the combustion-chamber or inner drum, G. In this manner the impure air will be fed to the flames or carried off with the smoke.

Fig. 5 shows an enlarged section of the registers  $r$   $r'$   $r^2$ , in which the registers  $r$   $r'$  are connected to one and the same shaft, to enable both to be operated by a single device and at

a single operation. The said registers  $r$   $r'$  are to be so arranged on the shaft that opening one will close the other. Any other convenient device or devices for operating the registers may be employed, if desired.

I am aware that a return air-circulating pipe has been provided with a branch pipe communicating with the outer air for supplying fresh air to the heating-drum, and that such return-pipe has been arranged to feed the foul air to the furnace. This construction, which I disclaim, differs from my invention, in that my circulating-pipes form a continuous flue through the heating-drum for every room in the house, thus preventing the admixture of air from different rooms, and the circulating-pipes are provided with leak-passages for the elimination of foul air therefrom.

What I claim is—

1. The method of heating and ventilating buildings, consisting in conducting heated air to the room to be heated and returning it to the heater with the admixture of fresh air, and back to the room without being mingled with air from other rooms, substantially as specified.

2. The method of heating and ventilating buildings, consisting in conducting heated air to the room to be heated, returning it to the heater, (with or without the admixture of fresh air,) eliminating the impurities of the used air on its return passage, and conducting the pure air back to the room without being mingled with air from other rooms, substantially as specified.

3. The combination, with a furnace, a hot-air-conducting flue, and a room to be heated, of a return-flue for said air having registers leading to said room and to the outer air, and a ventilating-flue having a register leading to said room, substantially as shown and described, whereby the room may be heated by a continuous circulation of air, or by the passage of air from the outside unmingled with the air within, or partly by both, as specified.

4. The combination, with a furnace, a hot-air-conducting flue, and a room to be heated, of a return-flue connecting solely with said conducting-flue, to prevent admixture of air from different rooms, and having a leak-passage for the escape of foul air, substantially as shown and described.

5. The combination, with a furnace, a hot-air-conducting flue, and a room to be heated, of a return-flue having a leak-passage for the escape of foul air, a foul-air chamber having a false bottom, and escape-pipes leading from below said false bottom to the combustion-chamber, substantially as shown and described.

6. A house heating and ventilating apparatus consisting of a series of continuous flues which are entirely separate from each other, and which open into and lead from separate rooms, and a furnace or other heating appa-

ratus for heating said flues collectively, substantially as shown and described.

7. The combination of the drums G and H, the flues C, passing separately through and  
5 out the drums, and the fire-pot I, substantially as shown and described.

8. The combination of the fire-pot I, the

diaphragm L, the pipe J, having damper K, and branch pipe J', extending below said diaphragm, substantially as shown and described. 10  
IRA JAMES ORDWAY.

Witnesses:

A. G. LYNE,  
SOLON C. KEMON.