(No Model.)

J. P. WOOD.

APPARATUS FOR HEATING AIR BY STEAM.

No. 258,189. Patented May 16, 1882.

Fig. 1.

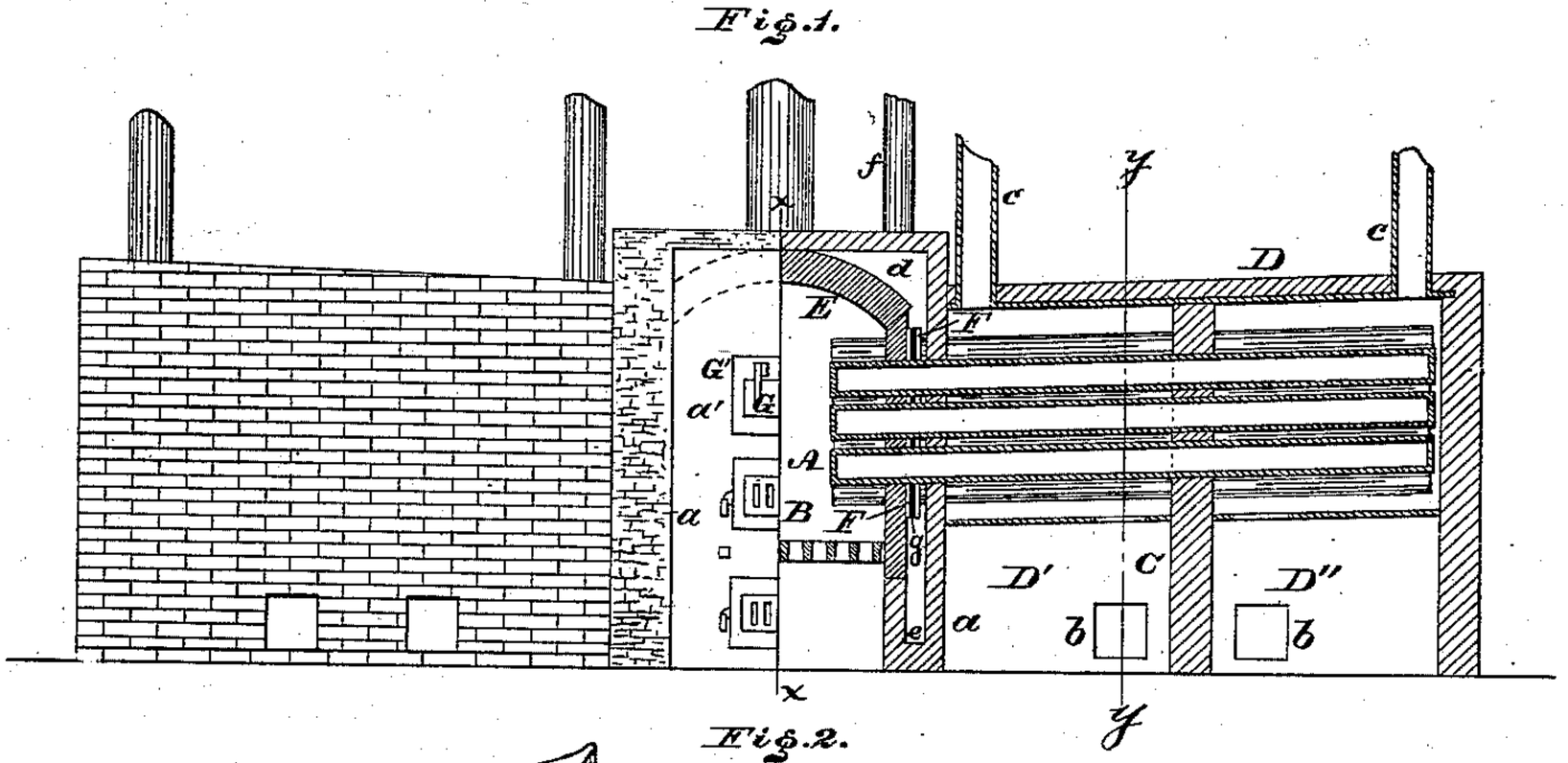


Fig. 2.

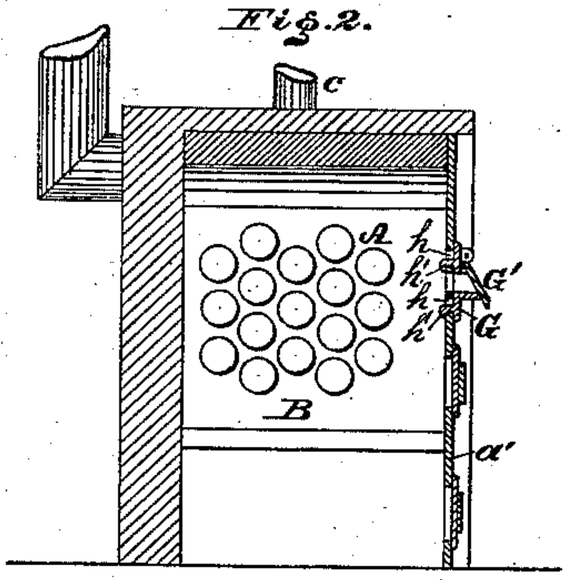


Fig. 3.

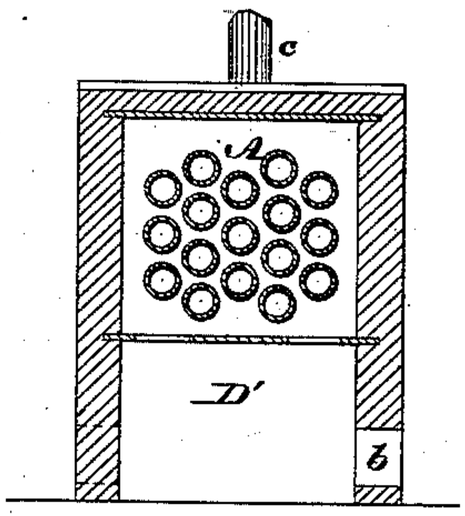
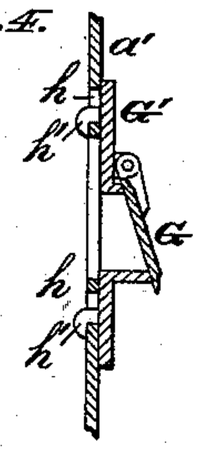


Fig. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR HEATING AIR BY STEAM.

SPECIFICATION forming part of Letters Patent No. 258,189, dated May 16, 1882.

Application filed December 7, 1881. (No model.)

To all whom it may concern:

Be it known that I, JAMES P. WOOD, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Heating Air by Steam in Vacuo, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a partial front view and vertical section of the heating apparatus embodying my invention. Fig. 2 is a transverse vertical section in line *x x*, Fig. 1. Fig. 3 is a transverse vertical section in line *y y*, Fig. 1. Fig. 4 is an enlarged vertical section of a detached part.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists, first, of a combustion-chamber, in combination with a heating-chamber arranged at the side thereof, a partition which divides said heating-chamber into a nearer section and a farther section, and two or more closed pipes extending from said combustion-chamber through or into each section of the heating-chamber, and an independent air-inlet and air-exit for each section of said chamber; second, of two plates having a packing interposed between them, and having openings to receive pipes, in combination with said pipes, the combustion-chamber, and the heating-chamber, all substantially as hereinafter set forth.

Referring to the drawings, A represents heating-tubes, each containing a small quantity of liquid in a vacuum, as shown in the Letters Patent, No. 181,125, granted to T. Angell, August 15, 1876; but other forms of tubes may be used, said tubes being supported on the walls *a*, which surround the combustion-chamber B, the inner ends of the tubes projecting into said chamber and on the bridges C, which divide the hot-air chamber D into sections D′ D″, each containing its own external air-inlet, *b*, and hot-air-discharge flue *c*. The combustion-chamber is lined with fire-brick, forming an inner wall, E, between which and the walls *a* of said chamber is an air-space, *d*, having one or more inlets, *e*, and an exit, *f*, the inlets *e* communicating with flues or pipes leading from apartments, so as to direct the foul air thereof to the space *d*, and the exit *f* discharging such air into the atmosphere, by which provision the apartments may be nicely and conveniently ventilated.

F represents plates, which are perforated for the passage of the tubes A, and arranged vertically in pairs against the outside of the fire-brick wall E, a filling, *g*, of fire-proof cement or other material being placed between the two plates, thus forming a tight joint between the combustion-chamber and the tubes, and preventing the escape of gases into the hot-air chambers, the perforated plates also serving to locate the tubes their proper spaces apart.

On the front plate, *a′*, of the apparatus is a door, G, the frame G′ whereof is removably fitted to said plate above the furnace-door proper. For this purpose the back of the frame is provided with inwardly and downwardly projecting hook-shaped lugs *h′*, which enter openings *h* in said plate surrounding the opening proper in said plate.

It will be seen that the door G may be used as a damper; but when access is required to the ends of the pipes within the combustion-chamber for cleansing the same, or other purposes, the frame G′ is raised clear of the openings in which the lugs are fitted, and thus the frame with the door is bodily removed from the plate, thus providing a large opening for the inserting of the cleansing tools or appliances. In order to restore the door, the frame is presented to the opening in the plate, and the lugs *h′* are inserted in the respective openings, whereby the frame is again located and secured in position.

The upright bridge C in the hot-air chamber D divides said chamber into sections, as has been stated, each independent of the other, and the tubes pass through said openings, and each section receives a full and ample supply of heat from the tubes, whereby there is a proper disposition of heat to the various exits or flues *c*, leading to different apartments and localities.

It is well known that often in furnaces where the hot-air chamber has several outlets the wind blows the heat to one end of the chamber, according to the direction of the wind, so that some of the outlets or flues, and consequently the apartments to which they lead, are

not supplied with heat. This defect is remedied by my construction—viz., the employment of the bridge C, each section of the hot-air chamber formed by the bridge having its own air-supply and heat-discharge independent of the other section or sections, and each section is heated by the tubes A, so that there is a reliable and uniform distribution of hot air from the apparatus, and each apartment or locality is unfailingly supplied.

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

1. The combustion-chamber B, in combination with the heating-chamber D, arranged at the side thereof, the partition C, which divides said heating-chamber into a nearer section and a farther section, the closed pipes A, extending from said combustion-chamber through the first section and into the other section of the heating-chamber, and an independent air-inlet and air-exit for each section of said chamber, substantially as set forth.

2. Two plates, F, having packing *g* interposed between them, and having openings to receive pipes A, in combination with said pipes, the combustion-chamber, and the heating-chamber, substantially as set forth.

JAMES P. WOOD.

Witnesses:

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