

(No Model.)

2 Sheets—Sheet 1.

C. M. LUNGREN.
GAS HEATING APPARATUS.

No. 247,372.

Patented Sept. 20, 1881.

Fig1.

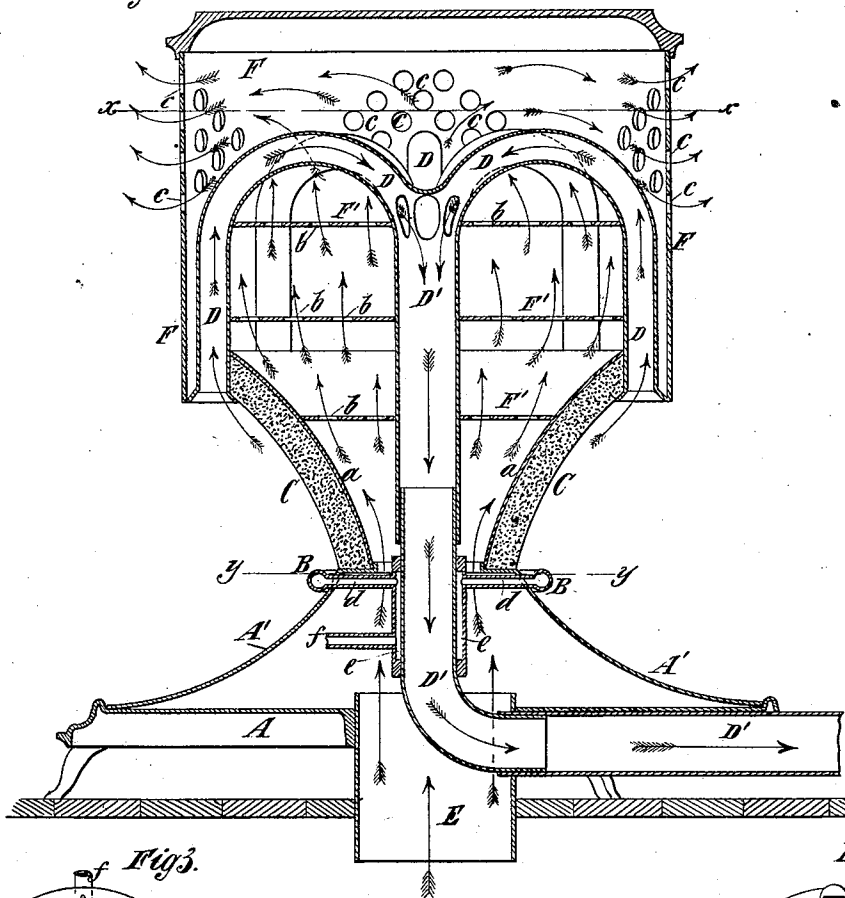


Fig3.

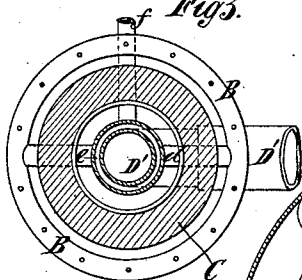


Fig2.

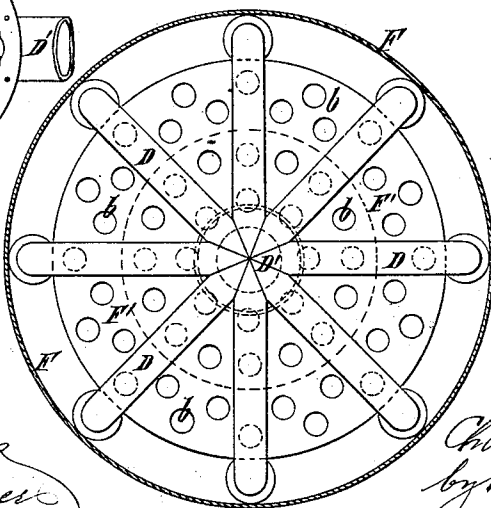


Fig4.

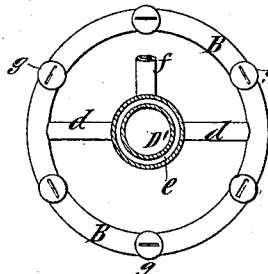
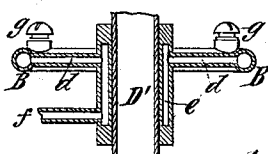


Fig5.



witnesses
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Charles M. Lungren
by his Attorneys
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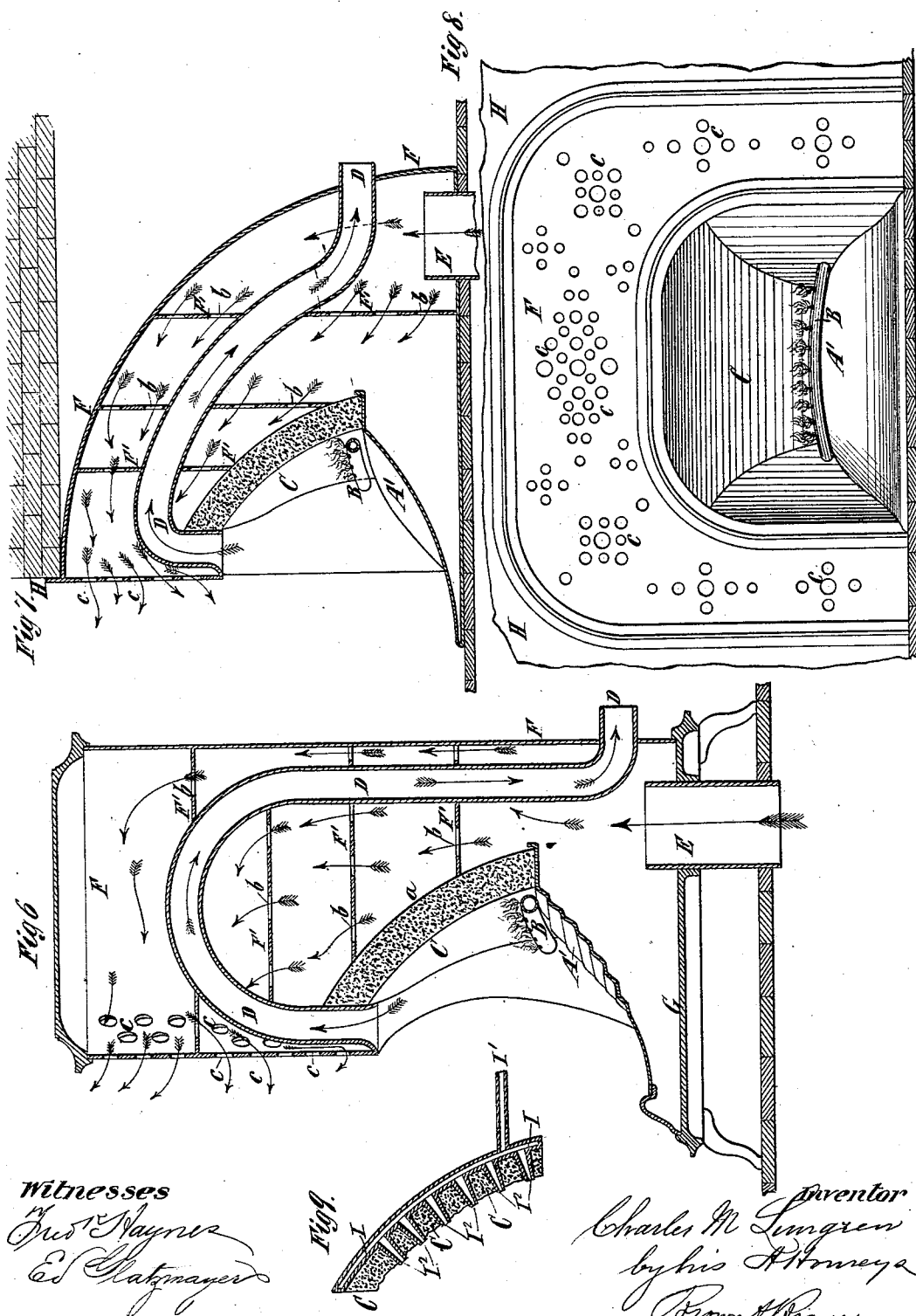
(No Model.)

2 Sheets—Sheet 2.

C. M. LUNGREN.
GAS HEATING APPARATUS.

No. 247,372.

Patented Sept. 20, 1881.



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UNITED STATES PATENT OFFICE.

CHARLES M. LUNGREN, OF NEW YORK, N. Y.

GAS HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 247,372, dated September 20, 1881.

Application filed January 19, 1881. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. LUNGREN, of the city and county of New York, in the State of New York, have invented certain new and useful Improvements in Gas Heating Apparatus, of which the following is a specification.

The invention has for its object the production of a gas heater by which the advantages of heating an apartment by direct radiation and by introducing into it a current of warm fresh air are combined, and which is so constructed that the maximum amount of the heat of the burning gas is utilized. This heater, which may be of any desirable form, consists essentially of three (3) parts: first, a radiator composed of or faced with fire-clay, asbestos, metal, or other suitable material which may be highly heated by gas-flames impinging against it and by the hot products of combustion passing over its face; second, a reflector of polished metal, glass, or other material, placed so as to reflect out into the apartment such portion of the heat from the radiator and gas-flames as would not otherwise be thrown in a desirable direction; third, a chamber through which the products of combustion pass to the chimney by suitable flues, and through which fresh air passes into the apartment in which the heater is placed, becoming warmed in its passage from suitably-arranged heated surfaces.

In the accompanying drawings, Figure 1 represents a central vertical section of a circular or annular heater embodying my invention. Fig. 2 represents a horizontal section upon the line *x x*, Fig. 1. Fig. 3 represents a horizontal section upon the line *y y*, Fig. 1. Figs. 4 and 5 represent, respectively, a plan and a central section of a burner of slightly-modified construction. Fig. 6 represents a central vertical section of a heater of modified form having a burner upon one side thereof only. Fig. 7 represents a vertical section of a heater adapted to fit within a chimney-breast to present the appearance of an ordinary grate. Fig. 8 represents a front view of the heater shown in Fig. 7; and Fig. 9 is a section of a modified construction of radiator and gas-burner.

Similar letters of reference designate corresponding parts in all the figures.

Referring first to Figs. 1 to 5, A designates

the base of the heater, represented as composed of metal, and of circular form.

B designates the gas-burner, which consists of an annular pipe perforated in its upper surface for the escape of gas, and from the said burner the upper surface of the base A slopes or curves downward and outward, and is preferably polished, or otherwise prepared or constructed so as to form a reflector, A', for reflecting heat from the burner outward into a room or compartment containing the heater.

C designates an annular radiator, arranged above the burner B and inclined or curved upwardly and outwardly over the gas-burner B; and at the upper edge of said radiator are pipes or ducts D, which radiate from a central pipe or trunk, D', and through which the products of combustion escape to the chimney, as indicated by the arrows within the pipes D D'. The radiator C may be composed of or faced with any material suitable for absorbing and radiating heat, and it preferably has an imperforate back plate, *a*, which prevents noxious gases or other products of combustion from passing through the back of the radiator and vitiating the fresh air before it is delivered into the room or apartment. The products of combustion from the burner B, in order to reach the escape-pipes D, pass upward in close contact with the radiator, and consequently they are deprived of a large portion of their heat, which is absorbed and retained by the radiator. The face of the radiator will become incandescent by the heat absorbed from the products of combustion, and it may have its face roughened to increase its radiating-surface.

E designates an air-inlet passage or duct, projecting upward through the base, and, as shown, in line with the pipe or trunk D', so that all fresh air entering the heater will pass upward in contact with the exterior of the pipe or trunk D', and thereby be heated.

Above the radiator C is an inclosing casing or shell, F, which is divided by one or more horizontal diaphragms or partitions, F', arranged at proper distances apart and perforated, as at *b*, the perforations in one plate being preferably out of line with those in adjacent plates. Above the upper partition, F', the case F is perforated, as at *c*, to permit of the

heated air entering the room or compartment in which the heater is placed.

It will be readily seen that the fresh air entering through the passage or duct E is heated by contact with the several partitions F' and the pipes D D', and by said partitions is retained for a longer time in the heater. Hence before it issues from the perforations *c* it is thoroughly heated.

For the purpose of effecting an economy in the consumption of gas I have shown the burner B as in communication, by means of branches *d*, with a jacket, *e*, which surrounds the pipe D', whereby the gas is heated before it passes to the burner.

In using heating-gas air may or may not be mixed with the gas; but where ordinary illuminating-gas is used it is desirable that air may be mixed with the gas to produce a smokeless flame, and the air may be admitted to the gas-supply pipe in a manner similar to the ordinary Bunsen burner.

The burner shown in Figs. 4 and 5 differs from that just described only in that, instead of simple perforations for the escape of gas, it is provided with burner-tips *g* of any suitable character.

Referring now to Fig. 6, the base G of the heater is shown as composed of cast metal, and upon it is supported a case, F, slightly different in form from that previously described. The reflector A' in this example of my invention is formed of a separate piece fitted in the case F, and the gas-burner B is shown as composed of a segmental tube having perforations in its upper surface, or provided with burner-tips for the issuance of gas. The radiator C is similar in arrangement and construction to that above described, except that it is of segmental shape, and it has an imperforate back plate, *a*, as previously described. From the top of the radiator extends an escape-pipe, D, for the products of combustion, which passes upward, and thence downward, and out near the bottom of the heater.

E designates a passage or duct through which fresh air enters, and the case is provided with horizontal partitions F', having perforations *b*, and has perforations *c* in its front for the purpose previously described.

Referring now to Figs. 7 and 8, F designates a case of a form and size to fit snugly within a chimney-breast, H, so as to present the appearance of an ordinary grate, and the arrangement and construction of the reflector A', radiator C, and gas-burner B, and escape-pipe D are all similar to corresponding parts in Fig. 6. In this example of my invention the perforated diaphragms or partitions F', instead of being arranged horizontally in the case F, are arranged vertically, and the front of the case is perforated at *c* to permit the escape of heated air into the room or apartment. The fresh air enters through a passage or duct, E, and thence passes in contact with the pipe D and the back

of the radiator C, whereby it is heated, as above described.

In all the figures it will be observed that within or back of the radiator, and partly above the same, is a space or chamber through which the fresh air passes upward, and through which extends a pipe or trunk for the passage of the products of combustion.

In all the figures previously described the burner B is represented as separate from and arranged below the radiator C; but, if desired, the burner may consist of a chamber or hollow wall, I, which is supplied with gas by a pipe, I', and from which the heated gas issues through jets I², the spaces between the jets being filled with fire-clay or other suitable material, so as to form an absorbing and heat-retaining radiator similar to those previously described.

By my invention I provide a heater of simple construction which is adapted for the economical consumption of gas.

Only one burner is here shown; but, if desirable, several may be used, placed one above another in such a way as to more effectively heat the entire face of the radiator.

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

1. In a gas-heater, the combination of a reflector extending downward and outward, a radiator arranged above said reflector and extending upward and outward, an escape pipe or flue for the products of combustion at the upper and outer edge of said radiator, and one or more gas-burners so arranged that their flames will burn in contact with said radiator and that the products of combustion must pass upward and outward over the face of said radiator to reach the escape pipe or flue, substantially as and for the purpose specified.

2. In a gas-heater, a reflector extending downward and outward, a radiator arranged above said reflector and extending upward and outward, an escape pipe or flue at the upper and outer edge of said radiator, and one or more gas-burners so arranged that their flames will burn in contact with said radiator and that the products of combustion must pass upward and outward over the face of said radiator before entering said escape pipe or flue, in combination with an air-chamber within and back of and partly above said radiator, into which fresh air is admitted, and which contains one or more perforated diaphragms and said escape pipe or flue, substantially as and for the purpose specified.

3. In a gas-heater, the combination of an annular reflector, an annular radiator, one or more annular gas-burners arranged between said reflector and said radiator, a passage or duct for directing fresh air upward through said reflector, radiator, and burner, and an escape-pipe, through which the products of combustion pass downward through said reflector, radiator, and burner, substantially as specified.

4. In a gas-heater, the combination of an

annular reflector, A', an annular radiator, C, a gas-burner, B, a passage or duct, E, for fresh air, a casing, F, constructed with horizontal perforated partitions or diaphragms F', radial escape-pipes D, and a central escape pipe or trunk, D', all substantially as specified.

5 5. A combined gas-burner and radiator for a gas-heating apparatus, consisting of a gas-chamber or hollow wall, an inlet-pipe for gas,

a number of jet-pipes projecting from the face 10 of said chamber or wall, and a filling of fire-clay or other suitable material secured upon the face of said chamber or wall around said jets, substantially as specified.

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Witnesses:

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