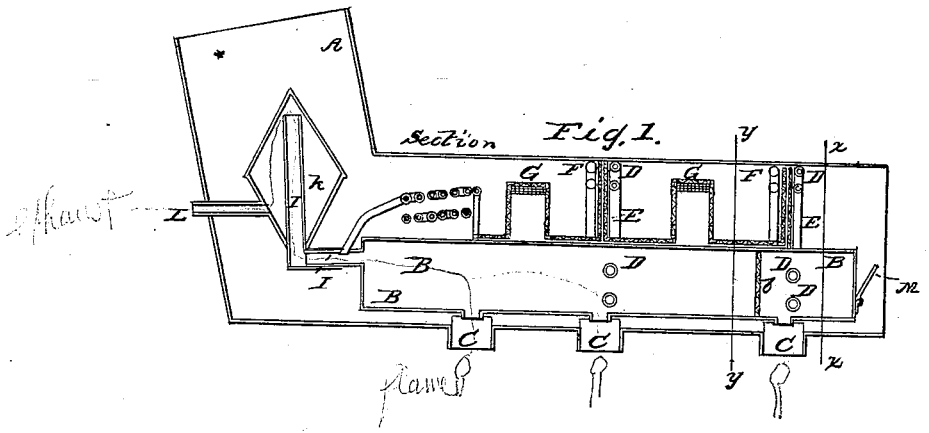
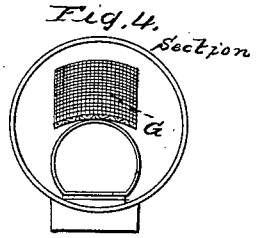
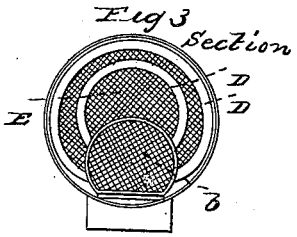
D. G. HASKINS.

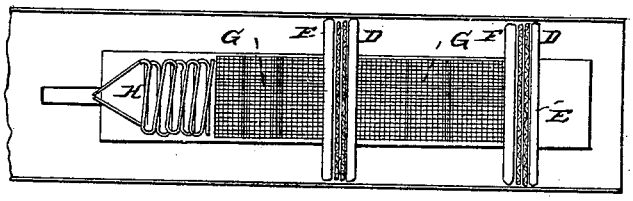
Gas Heating Apparatus.

No. 53,820. Patented April 10, 1866.









Witnesses:
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Inventor:
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UNITED STATES PATENT OFFICE.

DAVID G. HASKINS, OF CAMBRIDGE, MASSACHUSETTS.

GAS-HEATING APPARATUS.

Specification forming part of Letters Patent No. **53,820**, dated April 10, 1866.

To all whom it may concern:

Be it known that I, DAVID GREENE HASKINS, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and improved method of heating houses and apartments by the flame of gas or that of any oils or fluid which can be used for the purpose by means of an apparatus hereinafter described; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a longitudinal section of my apparatus, showing, in detail, several of the devices I design to make use of in carrying out my invention. Fig. 2 represents a plan view of the same, and Figs. 3 and 4 are transverse sections of the same, taken at the lines marked *x x* and *y y* in Fig. 1.

Similar letters indicate like parts in the several figures.

The object of my invention is to warm one or more apartments by air heated by the flame of gas or that of oils or other fluids which can be used for the purpose by means of pipes or conducting-tubes provided with registers introduced into the floors or walls of the apartments. A current of air is caused to pass over or through a series of radiating material so arranged as to absorb, conduct, and radiate the heat which may be imparted to the said material from the burning gases, &c.

The smoke and vitiated air from the burning gases, &c., are conducted off in a separate pipe or flue to the chimney or other place of exit.

In the drawings, A represents an outer casing, which may be of a cylindrical or other form and made of tin, galvanized iron, or other suitable non-conducting material. Within this casing is a smaller compartment or chamber, B, extending nearly the whole length of the casing, and made of cast or sheet iron or other good conducting or radiating material. The chamber B is made much smaller than the casing A, so as to leave a considerable space between the top of the said chamber and the inner upper part of the casing. On the under side of the casing A and chamber B are openings (one or more) corresponding with each other, and fitted with short sections of pipe. At these openings are placed the burners for gas or other heat-imparting flame generated from oils or other fluid, the flame passing into the chamber B.

At the rear end of the chamber B is a pipe, I, which passes into and extends to near the upper part of a drum, K, of any convenient or desirable form, and at the lower part of the drum is a pipe for conveying the products of combustion to the chimney.

The front part of the chamber B is provided with a door, M, for convenience of access to the interior of the said chamber when necessary, but is designed to be kept closed when the apparatus is in operation.

Within the chamber B may be arranged transversely one or more sheets or pieces of wire-netting, as shown at *b*, Figs. 1 and 3; or a series of metal plates extending partially across the chamber may be used, the said plates being attached alternately to the upper and lower sides of the chamber B, for the purpose of retarding the passage of the products of combustion and aiding in the radiation of heat.

In the space between the chamber B and outer casing, A, is arranged a series of devices, presently to be explained, in such a manner and of such material as to absorb, conduct, and radiate the heat derived from the burning gases in the chamber B. The front end of the outer casing, A, is left open, and may be made to communicate with the outer air, or the air may be supplied from the cellar or apartment in which the apparatus is located.

In the drawings are represented a variety of devices designed to be used in the air-heating space before referred to; but it is not necessary that all should be used in one apparatus at the same time. The space may be filled or provided with all of one design, or two or more may be used in combination.

D D represent hollow pipes passing transversely across the space between the casing A and chamber B, arranged concentrically with the outer casing, and placed at a greater or less distance from the same. The ends of the said pipes communicate with the inner part of the casing B, so as to permit the passage of the heated gases through the pipes.

F F are solid cylindrical rods attached at each end to the casing, and arranged similarly to the hollow pipes D.

E E represent sheets or pieces of wire-netting placed transversely across the air-heating space between the pipes D and F, with which

they are in contact, and, becoming rapidly heated, serve to impart additional heat to the air in its passage through the casing.

G G represent also sheets or pieces of wire-netting arranged within the air-heating space, and projecting upward at intervals from the upper part of the chamber B, to which they may be secured in any suitable manner.

Instead of wire-netting any other reticulated conducting material may be used.

H H are hollow pipes or tubes, which may be coiled or arranged in a zigzag position, communicating at one end with the inner chamber, B, and at the other end with the discharge-pipe at the rear of the said chamber.

By thus arranging the above-described radiating devices within the air-heating space a high degree of heat will be imparted to the same, so that the air passing over and between them will become sufficiently heated to warm apartments to which it may be conducted by pipes leading from the heating apparatus.

Actual experiment with a full-sized apparatus has demonstrated that with a comparatively moderate supply of gas a high degree of heat may be obtained.

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

1. The application, substantially after the manner herein described, of the flame of any gas, or of any oil or fluid, to the heating of a current of air which may be introduced from without into rooms, apartments, or buildings.

2. The combination, with an outer casing, A, and an inner chamber, B, of heat retaining and radiating devices, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DAVID GREENE HASKINS.

Witnesses:
J. H. ADAMS,
G. A. C. SMITH.