

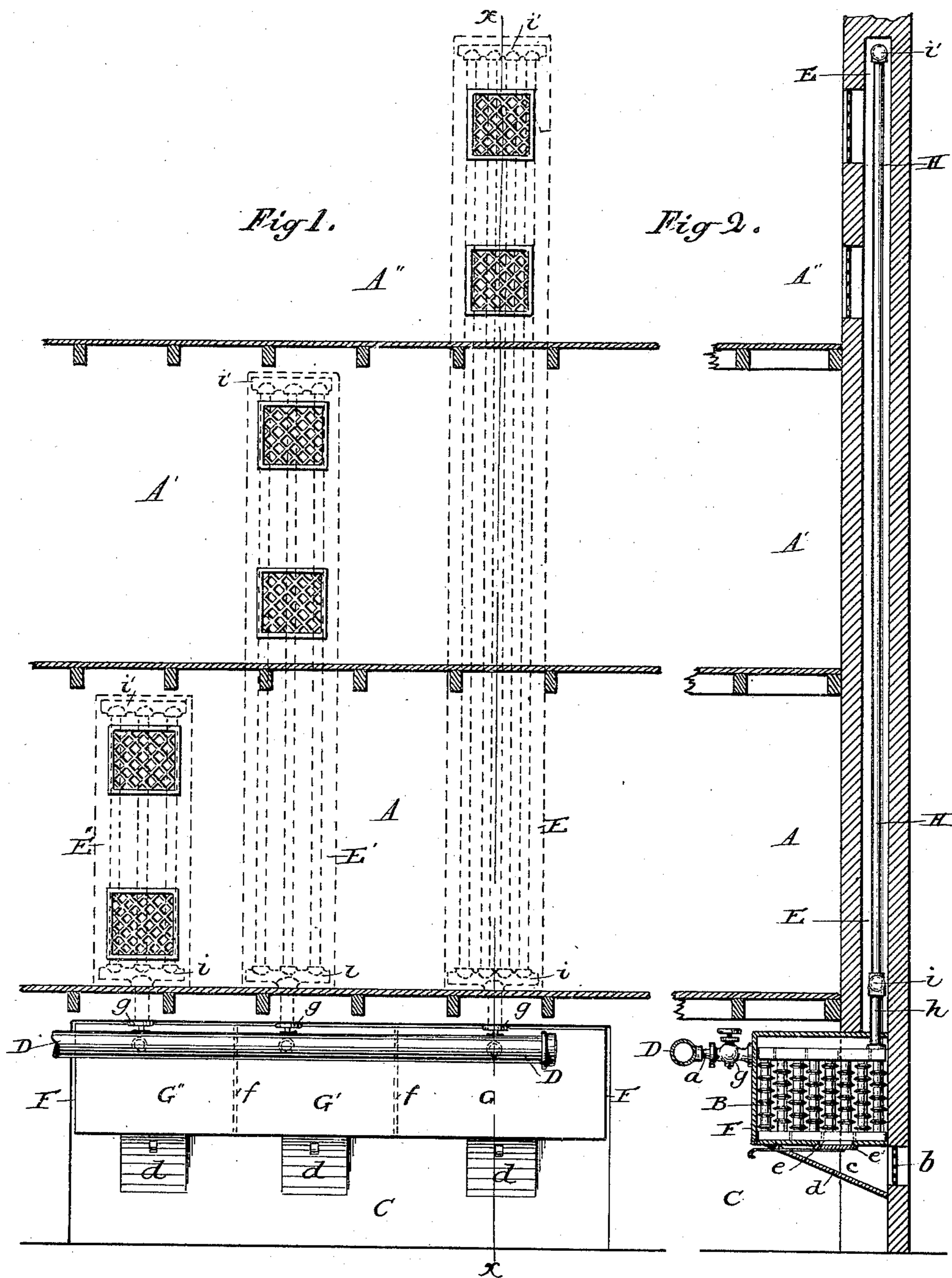
(No Model.)

A. P. HOWARD.

APPARATUS FOR HEATING THE AIR IN HEAT FLUES OF BUILDINGS.

No. 286,134.

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Witnesses :

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APPARATUS FOR HEATING THE AIR IN HEAT-FLUES OF BUILDINGS.

SPECIFICATION forming part of Letters Patent No. 286,124, dated October 2, 1883.

Application filed April 6, 1883. (No model.)

To all whom it may concern:

Be it known that I, ALBION P. HOWARD, a citizen of the United States, residing at Brooklyn, E. D., in the county of Kings and State of New York, have invented a new and useful Apparatus for Heating the Air in Heat-Flues of Buildings, of which the following is a specification.

This invention relates specifically to heating the walls of and the air in heat-flues, wherein the bottom of the flue is open for the entrance of the exterior air.

Heretofore in heating by indirect radiation the radiators have been placed at the entrance of the flues, where they heat the air, which is drawn up the flues and delivered through registers into the apartments. The defect in this method is that, as the bottom of the flue is open and the draft strong, the cold air is drawn into the flue before it becomes heated to the proper temperature, and as there is no means of heating it after leaving the radiator it passes out into the apartment in its cold state. Another defect consists in the waste of heat in heating the walls of the flues, which become cold as soon as the supply of air is cut off from below or the registers are closed above, in either of which cases the circulation of heated air in the flue is stopped.

The object of my invention is to obviate the above-mentioned defects; and it consists in providing the radiators for heating the air that enters the flue with extensions, which are carried up the flue, near to the top thereof, so as to convey the radiator-heat within the flue its whole length, and thereby insure the heating of all the air drawn into the flue and the walls of the flue, and prevent cold air from being delivered into the apartment.

It further consists in arranging the radiators in sections, so that every flue will communicate with a separate section, and thereby prevent the heat from being drawn into the flue having the greater draft.

In the accompanying drawings, Figure 1 represents a sectional front elevation of the interior of a building, showing the heating system and my improved mode of distributing and equalizing the heat. Fig. 2 is a vertical trans-

verse section of the same, taken on line *xx* of Fig. 1.

Referring to the drawings, A A' A'' represent a series of apartments on the several floors of a building, which are arranged to be heated by the radiator B, placed in the basement C, and connected by a branch pipe, *d*, with a steam heating-pipe, D, leading from the boiler. E E' E'' are the heat-flues leading to the several apartments A A' A''. The said flues are open at the bottom and closed at the top above the registers in the walls, through which the heat is delivered into the room. The object in making the flues open at the bottom is to give free access to the air, which is preferably drawn entirely from the exterior.

The radiator C may be of any suitable construction, and it is inclosed in a casing, F, in the usual well-known manner, said casing also inclosing the entrance to the heat-flues. Air is supplied to the radiators from the exterior through a grated opening, *b*, which opens into a space, *c*, inclosed by a partition, *d*. In the bottom of the casing F is an opening, *e*, which may be closed by a slide, *e'*, to regulate the admission of air to the radiators.

The radiator C is divided by partitions *f* into sections G G' G'', there being one section for each separate heat-flue, so as to prevent the heated air from being drawn entirely into the flue having the stronger draft. To enable one or more of the apartments to be heated exclusive of the others, each of the branch pipes *a* is provided with a valve, *g*, so that steam may be cut off from any one of the sections when it is desired to exclude heat from the apartment with which that section communicates. Each section of the radiator is provided with a branch pipe, *h*, which is carried into the flue at the base, and connects with a head, *i*, from which extends a number of steam-pipes, H, the upper ends of which terminate at or near the top of the flue, where they are connected with another head, *i'*. The steam from the radiators passes through the connecting-pipes *h* into the head *i*, and thence circulates through the pipes H the whole length of each flue, while the water arising from the condensation of the steam flows back into the

radiator, and thence to the boiler in the usual manner. By this construction advantages are secured which will now be described.

In heating apartments by means of flues
5 open at the bottom and receiving air from the exterior, the cold air, being drawn in by the draft created by the ascending column of partially-heated air, is apt to be carried into the flue before being heated by the radiator; and
10 as there have been no means previous to my invention for heating the cold air after entering the flue, the cold air was drawn to the registers and delivered into the room; but by means of my invention, however rapidly the air may
15 be drawn in, it will be exposed, after entering the flue, to the heat of the extensions H, and thereby raised to the proper temperature before reaching the registers. Furthermore, the heat from the extensions H communicates heat
20 to the walls of the flue and keeps the walls at a uniform temperature, so that the heated air is not absorbed by the said walls. This is an important advantage, as when the registers are closed or the supply of air is cut off below,
25 the heat rapidly radiates from the walls of the flue and leaves them cold, so that when the air is again admitted it requires considerable time to heat the flues again.

It will be observed that the extensions H are

inclosed wholly within the heat-flues, and are 30
not passed up through the partitions closing the upper ends thereof, whereby the heat in the extensions is prevented from being drawn out, and is utilized to keep the walls of the flue hot when the circulation of air in the flue 35
is stopped.

I claim—

1. In combination with the heat-flues having their tops closed and bottoms open, the radiator B, provided with extensions H, said ex- 40
tensions being inclosed wholly within the flues, substantially as specified.

3. In combination with the heat-flues, extensions H, wholly inclosed in the flues, the radiator B, casing F, partition d, cold-air open- 45
ing b, and a suitable damper to control the supply of air, substantially as specified.

3. In combination with the heat-flues of a building, a steam-radiator divided into sections corresponding to the number of heat- 50
flues, and suitable pipes provided with a valve to connect the said section with the main steam-pipe, substantially as specified.

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