

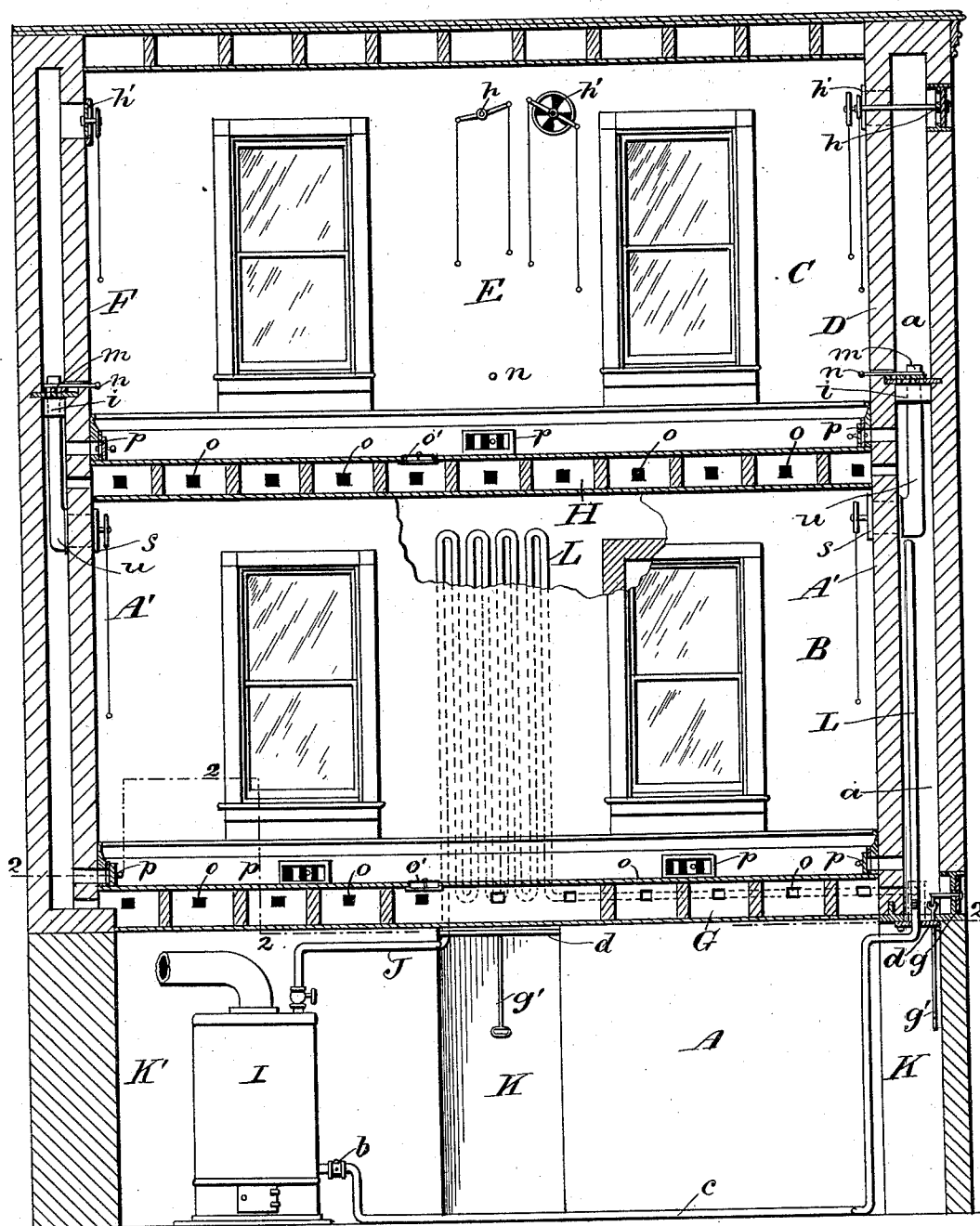
(No Model.)

2 Sheets—Sheet 1.

W. M. DECKER.
SYSTEM AND APPARATUS FOR HEATING, COOLING, AND
VENTILATING BUILDINGS.

No. 468,645.

Patented Feb. 9, 1892.



WITNESSES:

H. Walker
C. Sedgwick

INVENTOR:

W. M. Decker.
BY Munn & Co.

ATTORNEYS

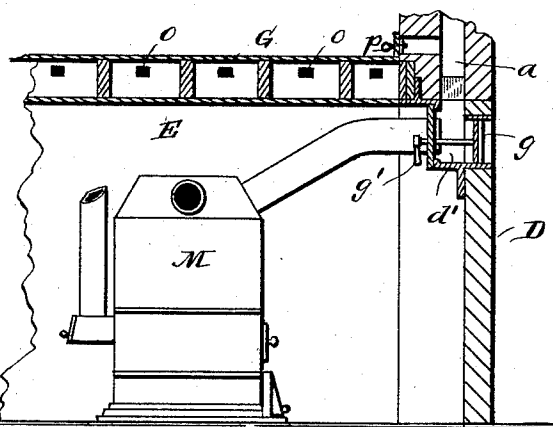
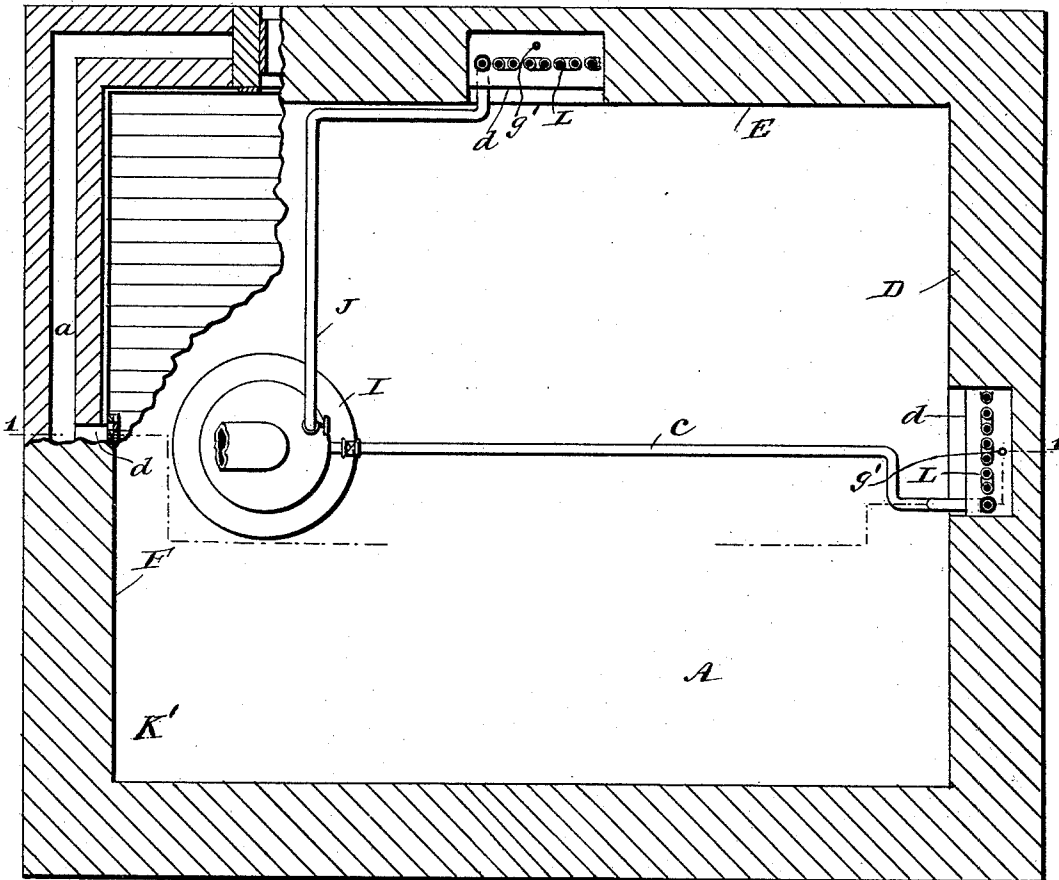
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Fig 3

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UNITED STATES PATENT OFFICE.

WILLIAM M. DECKER, OF KINGSTON, NEW YORK.

SYSTEM AND APPARATUS FOR HEATING, COOLING, AND VENTILATING BUILDINGS.

SPECIFICATION forming part of Letters Patent No. 468,645, dated February 9, 1892.

Application filed March 10, 1891. Serial No. 384,403. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. DECKER, of Kingston, in the county of Ulster and State of New York, have invented a new and useful System and Apparatus for Heating, Cooling, and Ventilating Buildings, of which the following is a full, clear, and exact description.

This invention relates to improved means for the warming, cooling, and ventilation of houses, as is hereinafter described and claimed.

Reference is to be made to the accompanying drawings, forming a portion of this specification, in which similar letters of reference indicate corresponding parts in all the views.

Figure 1 is an elevation in section of a building containing the improvement, utilizing steam or hot water as a source of heat. Fig. 2 is a plan in section of the structure shown in Fig. 1 and contained apparatus, taken on the line 2 2 in said figure; and Fig. 3 is a broken sectional elevation of the lower part of the building shown in previous figures, showing a hot-air heater in position for service in connection with the improved system for heat distribution.

This improved system for heating, cooling, and ventilating buildings is adapted for use in all architectural structures that are provided with intercellular spaces in side walls and similar spaces between floors, and it may here be stated that any manner of constructing such spaces may be utilized in buildings constructed of any material that is most convenient or may be preferred by the builder.

In Fig. 1 a building of three stories is depicted to illustrate the system, it being understood that the details with regard to minor features may be changed to suit the situation.

A B C respectively represent the several stories from the ground floor upwardly, D E F the side walls of the building, and G H the floors intervening between the stories. The side walls D E F shown, as well as the one removed by cutting the section in Fig. 1, are each provided with an intercellular space *a*, which is preferably extended from the lower floor G upwardly to or near to the roof of the building.

If steam or hot water is to be used in the heating of the building, any preferred form of steam-generator or water-heating device (represented at I) is located in the lower story and adapted for service by connecting the steam or hot-water pipe J with any desired number of pipe-coils L, which are placed within the intercellular spaces *a*, said coils being preferably joined together in series and also with the steam or hot-water generator I at or near its base, a check-valve *b* or similar device being provided near the point of entrance of the return-pipe *c*.

At the points where the coils L are introduced within the spaces *a* there are niches K, formed in the foundation-walls of the building directly below said points to facilitate the insertion of the coils, and to close the openings provided for the same purpose a sealing-plate *d* is secured over each aperture below the coil, which plates are perforated to receive the pipe J. The exterior portion of each hollow side wall is apertured above and near to the plates *d* for the reception of cold-air registers *g*, which may be controlled by the depending handles *g'*, that are affixed to the inner ends of the shafts, whereon the revoluble gates of the registers are attached. Any other well-known device adapted for the graduated introduction of cold air from the outer atmosphere into the boxes *d* may be substituted for the registers shown. The laterally-continuous spaces *a* are sealed at all points other than where the niches K are formed by the foundation-wall K', as shown at the left side of Fig. 1.

Near the upper terminals of the intercellular spaces *a* there are registers *h*, located in the outer portions of the side walls, which are adapted for convenient manipulation to graduate the outflow of air from the spaces *a* when this is desired. There are similar or other shaped registers *h'* formed or introduced above in the inner side wall shell of the third story at any desired points, these being adapted, when opened, to afford exit-passages for foul air or any excess of heat in the upper part of the rooms, wherein said registers are located. Preferably the registers *h'* are placed in nearly the same horizontal plane with the registers *h*.

At *i* horizontal division-walls are introduced in the air-spaces *a* of the side walls D E F, and at any desired points the slide-gates *m* are placed over proper apertures in the division-walls, which gates are moved by rods *n*, that project through perforations in the inner shell of the side walls, so as to be conveniently manipulated, as may be required to regulate the upward flow of hot or cold air in the spaces *a*.

There are series of suitably-spaced passages *o* leading from the vertical spaces *a* into the spaces between the floors and adjacent ceilings of the building, these apertures being formed in the inner shell of the double side walls and adapted to introduce warm or cold air that may pervade the air-spaces *a*, and in the floors of the rooms the registers *o'* may be placed to introduce hot or cold air through the floors into the rooms.

Within the apartments of the building, preferably near their floors, any desired number of registers *p* are introduced into the side walls, so as to afford means for the graduated introduction of hot or cool air from the intercellular spaces *a* into any of the said apartments, the form of the registers being immaterial, so that they are well adapted to their use.

When the described apparatus is to be used as a heat-supply for the building, steam or hot water is generated in the boiler I, from which it is circulated through the coils L. The cold-air registers *g* are adjusted to permit a proper inflow of air from without the building, and thus by contact of the inducted air with the pipe-coils L a proper supply of pure warm air is furnished that may be introduced into any apartment by opening the registers *p*, their adjustment regulating the heat to afford an equal temperature of proper degree, the registers *h* by their proper adjustment affording means to control the heat in and remove foul air from the air-spaces *a*, and consequently from the rooms of the building so provided.

Within apartments that are below others in a building heated in the manner hereinbefore explained there are foul-air discharging-registers S provided, which are placed near the ceilings of the rooms in the side-wall shells A', for example, and have direct connection with short flues *u*, that extend upright within the air-spaces *a* above the floor H and through the horizontal division-walls *i* to convey foul air away from the room B. It will be seen that the continuous envelope of hot air afforded by this method of heating a building avoids drafts of air having unequal temperature and affords a uniform heat and pure air, as well as ventilation, throughout the building.

In warm weather, when the heating apparatus is out of service, the proper manipulation of the cold-air registers *g h m* and the induction-registers *p* will introduce a graduated flow of cool air throughout the spaces *a*

and between the floors of the apartments, and, if desired, into the rooms through the registers *p* and out through the registers *h'* and *s*.

If hot air is to be produced by the use of a furnace M, (see Fig. 3,) such a device of any well-approved construction may be substituted for the steam or hot-water boiler I, and in this case the coils L will be dispensed with. The cold air that has become heated by contact with the interior air-spaces of the furnace is conducted therefrom into the boxes *d'*, that are constructed as shown, and thence into the spaces *a*, to be distributed, as before explained. The cold-air registers *g* below, being generally kept closed in cold weather, may be slightly opened if an admixture of cool air is desired.

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

1. The combination, with a building having laterally-continuous spaces *a* in its walls, adapted to receive heat from a suitable source, of a cold-air inlet at the lower end of said space, valved openings *p*, leading into space *a* from the rooms at the floor-line, openings leading from the spaces between the floor and ceiling joists into the space *a*, a register in the floor conducting air from the said floor-space into the room, and an outlet in the outer wall to permit air to escape from space *a* into the outer air, substantially as shown and described.

2. A building having laterally-continuous air-spaces *a* in its walls, a suitable source of heat, horizontal partition *i*, dividing the space *a* above the floor-line and provided with valved openings, the spaces between the floor-joists communicating with the space *a* below said partition, valved openings *p* from the rooms at the floor-line into space *a* below said partition, cold-air inlet *g*, and the registers *s* at the upper part of the wall of the lower room and communicating with a flue *u*, leading up through partition *i*.

3. In a system of mural heating, a building provided with hollow walls, the spaces *a* in which are laterally continuous, opening *o*, leading into said space from between the floor-joists, and valved openings *p*, leading into space *a* from the floor-lines of the upper and lower rooms, a horizontal partition *i* in space *a* above the upper floor-line and having valved openings controlled from the upper room, as at *n*, and the outlet-registers *h* in the outer wall at the upper end of space *a*, substantially as shown and described.

4. A building having hollow walls forming a laterally-continuous space *a*, with which the spaces between the floor-joists freely communicate, the cold-air register *g* in the outer wall at the first floor-line, niches K in the foundation-walls, communicating with space *a*, apertured plates *d*, closing places where space *a* opens into said niches, coils of heating-pipe in the space *a* above said plates, supply and return pipes leading through said

plates to a heater I, the horizontal partition
i in space above the upper floor-line and
provided with valved openings, the valved
openings p in the upper and lower rooms at
5 the floor-line, the flues u, leading from the
lower room up through partition i and pro-
vided with registers h', the floor-registers o',

and the outlet-registers h in the outer wall
at the upper end of the space a, substantially
as shown and described.

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Witnesses:

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CHAS. VAN BUREN.