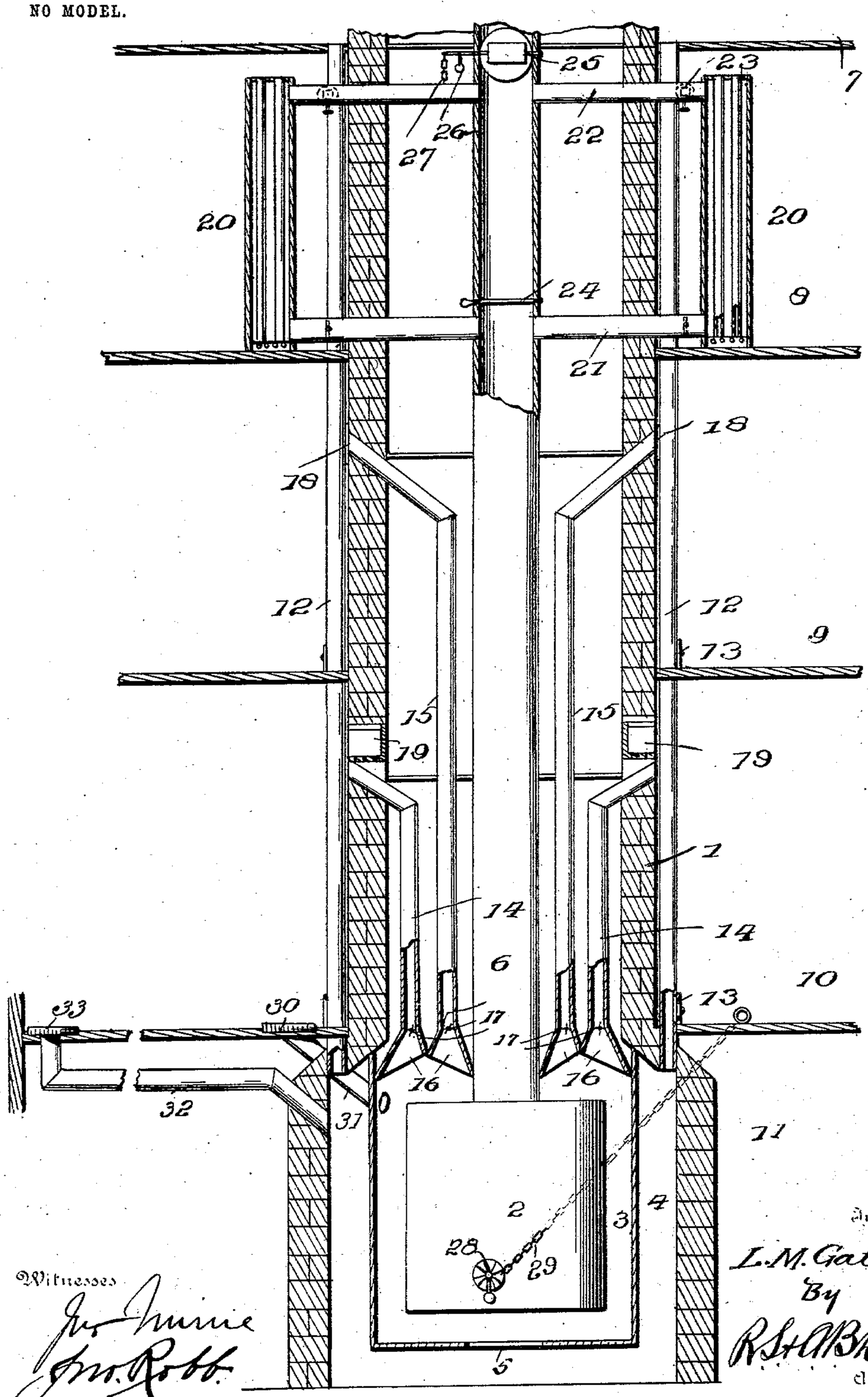
No. 753,253. PATENTED MAR. 1, 1904.

L. M. GATES.

SYSTEM OF HEATING BUILDINGS OR DWELLINGS.

APPLICATION FILED JAN. 29, 1903.

NO MODEL.



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No. 753,253. Patented March 1, 1904.

UNITED STATES PATENT OFFICE.

LAFAYETTE M. GATES, OF MUSCATINE, IOWA.

SYSTEM OF HEATING BUILDINGS OR DWELLINGS.

SPECIFICATION forming part of Letters Patent No. 753,253, dated March 1, 1904.

Application filed January 29, 1903. Serial No. 141,039. (No model.)

To all whom it may concern:

Be it known that I, LAFAYETTE M. GATES, a citizen of the United States, residing at Muscatine, in the county of Muscatine and State of Iowa, have invented certain new and useful Improvements in Systems of Heating Buildings or Dwellings, of which the following is a specification.

This invention provides a system whereby buildings may be economically heated and ventilated at the expenditure of a minimum amount of fuel and a saving of valuable floor-space.

In accordance with this invention a chimney or flue is centrally disposed and of a size to receive a number of pipes. This flue runs from the basement or lowermost floor vertically through all the floors of the building and out through the roof. The stove or heater is located at the bottom of the flue and is surrounded by hot and cold air spaces. The smoke-pipe from the stove extends through the flue and is provided near its upper end with a set of dampers for diverting the smoke and products of combustion through radiators located upon an upper floor. One or more cold-air pipes extend from the upper floor of the building to the cold-air space surrounding the stove and has register communication with the lower portion of each of the floors through which it passes. Damper-controlled hot-air pipes are located in the flue and extend from the hot-air space surrounding the stove to the rooms on each floor to be heated.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and drawings hereto attached.

While the essential and characteristic features of this invention are susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawing, which is a vertical central section of a flue, showing the manner of heating the several floors of a building bordering thereon in accordance with the principles of this invention.

In the installation of the invention the dwelling, building, or like structure is provided, preferably at a central point, with a flue or chimney 1, which extends from the lowest floor or basement in a direct line through all the floors and roof. This flue may be of masonry, metal, or terra-cotta and is of a size to conveniently receive the several pipes, which hereinafter will be referred to in detail. While it is preferred to locate the flue or chimney at a central point, so as to have the greatest number of rooms border thereon, it may be arranged in any position within the spirit of the invention. The lower portion of the flue or chimney is enlarged, so as to receive the stove or heater 2 and the hot and cold air spaces 3 and 4 surrounding the said stove or heater. The hot-air space 3 is adjacent to the heater, and the cold-air space 4 is exterior thereto and is in communication at its bottom with the hot-air space, as shown at 5. The smoke-pipe 6 extends from the stove or heater 2 through the flue or chimney 1 and preferably occupies a central position.

The several floors of the building or structure are indicated at 7, 8, 9, 10, and 11, the latter being the basement and the numeral 7 designating the attic. One or more cold-air pipes extend from the attic or topmost floor 7 of the building to the cold-air space 4, so as to supply the latter with air to be heated and delivered to the several rooms or apartments to be warmed. The air-supplying pipe or pipes 12 is in communication with each of the floors, near the bottom thereof, by means of registers 13, so as to carry off the cool air from the lower portion of said floors, rooms, or apartments, thereby in a measure ventilating the same without creating any appreciable draft. The pipe or pipes 12 is arranged exterior to the flue or chimney, but adjacent thereto.

A series of hot-air pipes are located within the flue and connect at their lower ends with the upper portion of the hot-air space 3 and at their upper ends with the rooms or floors to be heated. The pipes 14 extend from the hot-air space 3 to the floor 10 immediately above the basement or the floor containing the heater, whereas the pipes 15 extend from the hot-air space to the second floor from said

basement. The lower ends of the hot-air pipes flare, as shown at 16, and are provided with dampers 17 to admit of regulating the amount of hot air to be supplied to any floor or room. A register 18 is provided at the upper or delivery end of each flared pipe to admit of the occupant of the floor or room controlling the amount of hot air to be supplied thereto. In order to render the air humid, closets or boxes 19 are arranged adjacent to the delivery ends of the hot-air pipes and are adapted to receive vessels containing water, the latter being evaporated by the heat and carried along therewith into the room or floor, so as to render the air moist.

The uppermost habitable floor or room (indicated by the reference-numeral 8) is preferably heated by radiators 20, each consisting of a drum and a series of vertical hot-air pipes passed therethrough. A pipe 21 connects the lower end of a radiator with the smoke-pipe 6, and a corresponding pipe 22 connects the upper portion of the radiator with said smoke-pipe, each of the pipes 21 and 22 being provided with a damper 23. A damper 24 is located within the smoke-pipe 6 at a point above the juncture of the pipes 21 therewith, and a second damper 25 is arranged within the smoke-pipe 6 above the juncture therewith of the pipes 22. Upon closing the damper 24 and opening the dampers 23 and 25 the smoke and products of combustion are caused to circulate through the radiators 20, thereby utilizing in a practicable manner the heat which would otherwise be lost. The upper damper 25 is a check-damper and is normally held open by means of a weight 26, and said damper is adapted to be controlled from the basement or lowermost floor of the building by means of a chain or like connection 27, connected at its upper end to the stem of the damper 25 and extending within convenient reach of the point of operation.

By having the chimney or flue 1 centrally located—that is, with the greatest number of rooms bordering thereon—economy of construction, space, and consumption of fuel is attained. It is to be understood, however, that any one or more of the hot-air pipes may be extended so as to heat a room remotely situated from the flue or chimney without departing in any essential particular from the spirit of the invention.

The draft of the heater or stove is regulated by a damper 28, weighted so as to remain normally open and adapted to be controlled from the first floor by means of a chain or connection 29, extended to a convenient point. A pull upon the connection 29 closes the damper 28 more or less against the action of the weight, and when released the damper is automatically opened by means of the weight, as will be readily comprehended. For heating the reception-room or hall upon the first floor a hall-register 30 is provided and connected, by means of a pipe 31, with the hot-air space 3. A cold-air pipe 32 connects a floor-register 33, remotely situated in the reception-room or hall, with the cold-air space 4. As the cold air is displaced in the reception-room by entrance of the hot air from the register 33 it passes through the pipe 32 to the cold-air space and is heated in transit to the hot-air space and is distributed to the floors or rooms to be heated in the manner stated.

Having thus described the invention, what is claimed as new is—

In a system of heating buildings, a flue extended though the floors thereof, a heater located within the lower end of the flue, a smoke-pipe extended centrally through the flue from the heater, hot and cold air drums surrounding the heater and in communication with each other at their lower ends, a cold-air pipe disposed exterior to the flue and extended from the upper floor of the building to the cold-air drum and in communication with each of the floors by means of a register, a plurality of hot-air pipes located within the flue and in communication at their upper ends with the respective floors and at their lower ends with the said hot-air drum, said hot-air pipes being arranged adjacent the smoke-pipe, and damper means for controlling the air passing through the several pipes aforesaid.

In testimony whereof I affix my signature in presence of two witnesses.

LAFAYETTE M. GATES. [L. S.]

Witnesses:
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