MARIA L. GHIRARDINI.

CHIMNEY.

No. 185,741. Patented Dec. 26, 1876.

Fig. 1.

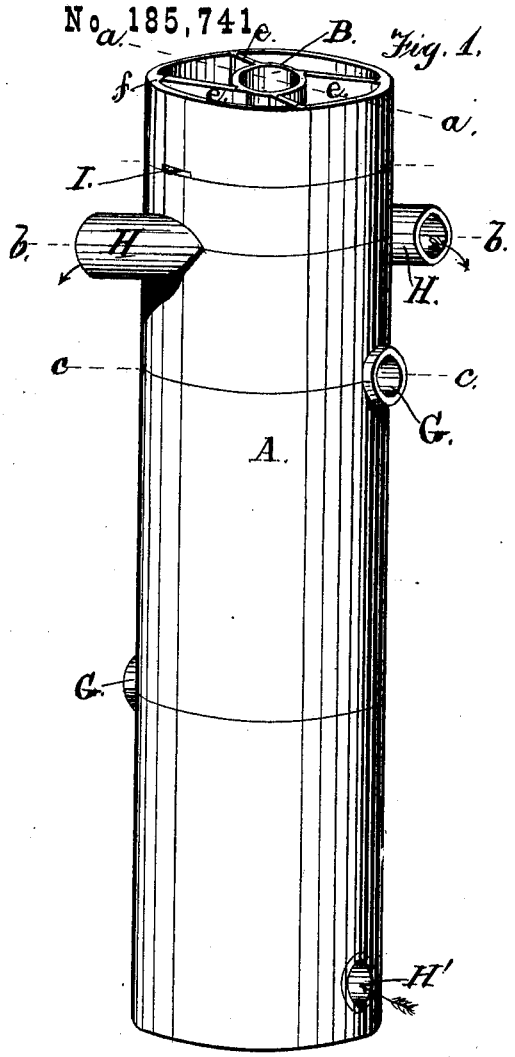



Fig. 2.

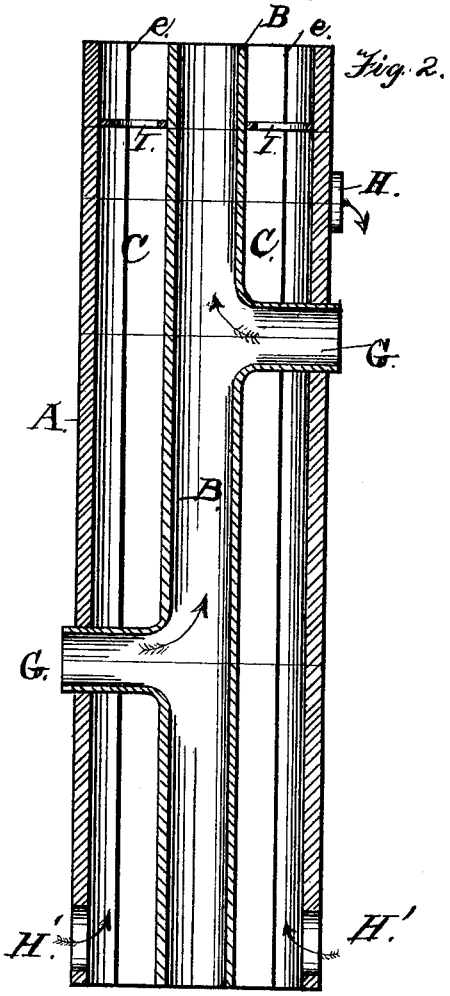



Fig. 3.

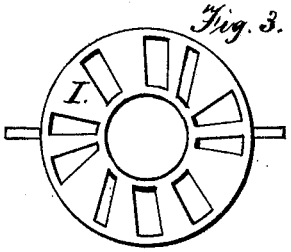



Fig. 4.

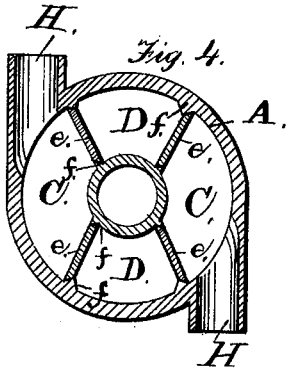
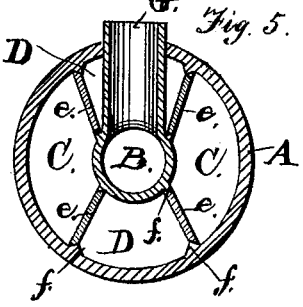



Fig. 5.




WITNESSES.

Frank Hamilton.

John Robey, Jr.

INVENTRESS.

Maria L. Ghirardini.

by John J. Halsted,

Atty.

# UNITED STATES PATENT OFFICE.

MARIA L. GHIRARDINI, OF PAWTUCKET, RHODE ISLAND.

## IMPROVEMENT IN CHIMNEYS.

Specification forming part of Letters Patent No. **185,741**, dated December 26, 1876; application filed March 25, 1876.

*To all whom it may concern:*

Be it known that I, MARIA L. GHIRARDINI, of Pawtucket, in the State of Rhode Island, have invented certain new and useful Improvements in the Art of Constructing and Building Chimneys for Dwellings and other Houses; 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 part of this specification.

My improvement consists, mainly, in the employment of a smoke flue or flues, placed within another flue, which is divided into longitudinal compartments, constituting a series of separate flues, serving to convey and utilize the heat in several directions at the same time, for separate ventilation, and also for the escape of foul air from the rooms by flues distinct from the heating and ventilating ones; and also for the economy of heat, as more particularly hereinafter described.

In carrying out my invention I prefer to use pipe made of cement for the outer pipe, and of clay for the inner or smoke flue, these pipes being cast, rolled, or molded in sections of convenient length, preferably each of one and two feet long. They may, of course, be made of other material when desired—as, for instance, of iron or other metals, asbestus, papier-maché, or wood, if rendered non-combustible—the construction of the chimney, and not the material used, being the essential feature of my invention.

Figure 1 shows sufficient of a chimney constructed in accordance with my invention to illustrate the principle. Fig. 2 is a vertical section of Fig. 1, in the line *a a*. Fig. 3 shows one form of register or regulator adapted for the same. Fig. 4 is a cross-section through Fig. 1, in the line *b b;* and Fig. 5, a cross-section in the line *c c*.

The outer pipe A I make large enough to inclose not only the smoke-flue B, but also to leave between the two pipes ample spaces C C for ventilation, fresh air from without being admitted into these inclosed spaces between the pipes. This air, so admitted from any convenient point, becomes warmed by contact with the exterior of the smoke-flue, and the escape of foul air from apartments, as it enters into the spaces D D between the pipes, is greatly accelerated by the heat, also radiated from the smoke-flue. Partitions *e e* separate the cold-air flues C C from the foul-air flues D D. These partitions may be constructed of slate, tile, asbestus, or any suitable non-combustible material, and may be held in place by grooves or ribs, as shown at *f f*. G G indicate the side flues or inlets into the main or central pipe, and H H the outlets from the outer pipe, for admitting fresh air into contiguous rooms or apartments, these outlets communicating through the spaces C C with the open air from below the first floor—as, for instance, at H′.

A register, I, of any appropriate sort, may be employed at any proper place or places in the chimney, to cut off or let on the currents, as may be found desirable. The register may be adapted for closing one or two flues independently; but as I make no claim in this application to the construction or action of the register, it need not be further described. The side flues, instead of being made integral with the pipe B, may be inserted therein through the exterior pipe A.

When the structure of the building or other circumstances render it desirable, provision should be made for the winding of the flues for side walls, to bring them into the best position to receive the ventilators on the different floors.

My improvement combines all the advantages of an open fire-place with those of a closed one; but it is superior to the open fire-place, inasmuch as the fresh air from without, instead of being drawn into the room while cold, through chance cracks and crannies, and under the doors, comes already warmed directly into the upper part of the room through the passages C H, while the foul air is drawn from the floor, or from any other appropriate place, by the current engendered in the flues or spaces D D, by the heat in the contiguous smoke-pipe B.

These advantages need not be limited or confined to the rooms next adjacent to the chimney, for by pipes placed in the side walls of the rooms I may connect the chimney with the most remote apartments, and thereby ventilate them.

My apparatus is very economical of heat, as, by closing the ventilating-flues at both ends, nearly all the heat irradiated from the smoke-flue, which is now largely wasted, would be turned into the rooms.

I find by experience that my invention works successfully, and that a small pipe carries the smoke of several fires, a six-inch flue disposing of the smoke of five fires, and all working satisfactorily.

The cost of my chimney is not more than that of an ordinary one built of brick, and is less than such a one thrown up edgewise with mortar, and being cemented, it is exempt from the risk of fires from defective flues, which is a prolific source of loss to insurance companies.

In a sanitary point of view, this invention is of the greatest importance, as it effectually carries off the impure, and supplies pure but not cold, air, and it does this by separate flues, so that the pure air discharged into the rooms is kept distinct from and does not commingle with the foul or impure air, which is carried off from the room or rooms by the other flues or compartments of the chimney. It is also applicable to the cheapest dwellings, and saves for the consumer much heat that otherwise would be lost.

It will now be seen that the vertical partitions *e e* form compartments in the ventilating-flue, resolving the same into a series of separate flues, some of which are for the reception and delivery of fresh air, and others for the carrying off of foul air; that by these means the foul air from one room is not carried into other rooms above it, as would be the case if all the space surrounding the smoke-pipe B were a continuous single space; that heat is materially economized; that it can be effectively utilized and conveyed into different rooms on opposite sides of the chimney at the same time, at the same elevation, and by distinct passages or channels; that without such partitions or divisions the attempt to heat two such opposite rooms would result in discharging nearly all of the heated air into that room which had a draft, and which should chance to be most open, while that room which should chance to be closed would receive hardly any, for heated air will rush in the direction of a current.

Again, by my construction, there is secured an independent use of the two flues for each of the two rooms; for instance, the room to the right or one side of the chimney, the top or higher register being closed, may be receiving heat from both the flues C and D, while the other room, at the left side of the chimney, may be ventilated by the circulation of a current of fresh air directly through it, entering through one and passing out through the other flue.

Again, the escape of foul air may be at any desired elevation; but with the single ventilating-flue cold air will of necessity enter at the opening nearest the floor, while the air leaving the room will leave or make its exit from the top, because it is the warmer. By having, as in my construction, distinct flues, this is controllable, and the air leaving the room may be made to leave wherever found most desirable, but preferably at about the height of the upper part of an open fire-place.

By admitting the fresh air at or near the ceiling, it will have had longer contact with the hot smoke-flue, and become heated as much as practicable, and, being then thrown upon the warmed upper ceiling of the room, will serve to equalize the temperature of the room.

I do not claim the building up of chimneys by means of blocks of a size the whole area of the chimney, through which blocks are passages for smoke, and also for air.

I claim—

1. The chimney-stack described, consisting of a clay or metallic smoke-flue, B, located within a clay, concrete, or metallic cylinder, A, said flue and cylinder having openings therein, as shown and described, and being each made in independent sections, and separated from each other by the partitions *e e*, as set forth.

2. In combination, the foul-air-outlet flues D, provided with appropriate inlets H′ thereto from any given room or rooms, the independent fresh-air-inlet flues C, provided with outlets H, adapted to convey fresh air into the same or other room or rooms, and an appropriate register or registers adapted to control the admission or exclusion of the fresh air at will, substantially as shown and described.

MARIA L. GHIRARDINI.

Witnesses:
SIMON S. TOPHAM,
PHINEAS FAIRBROTHER.