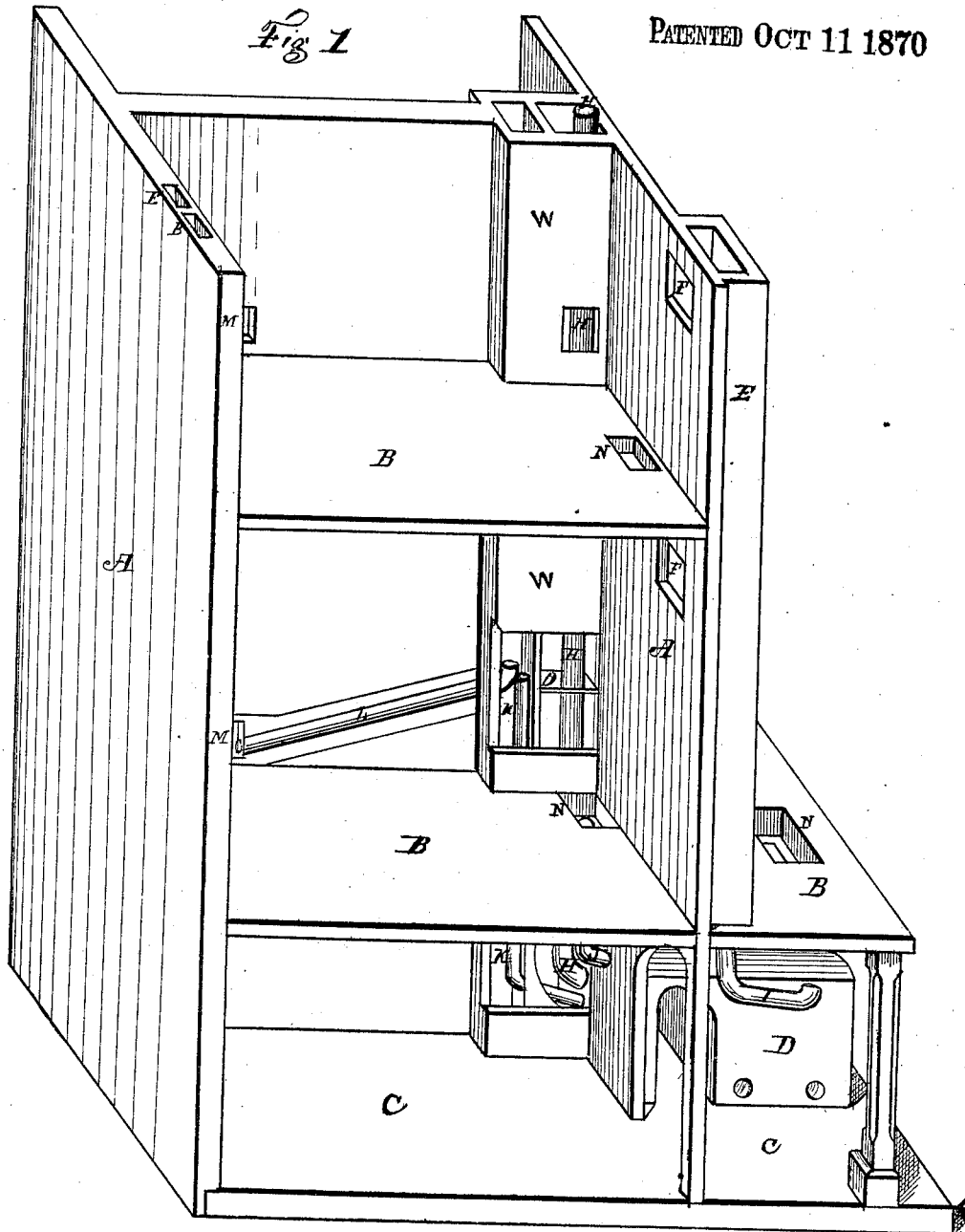


Plate 1

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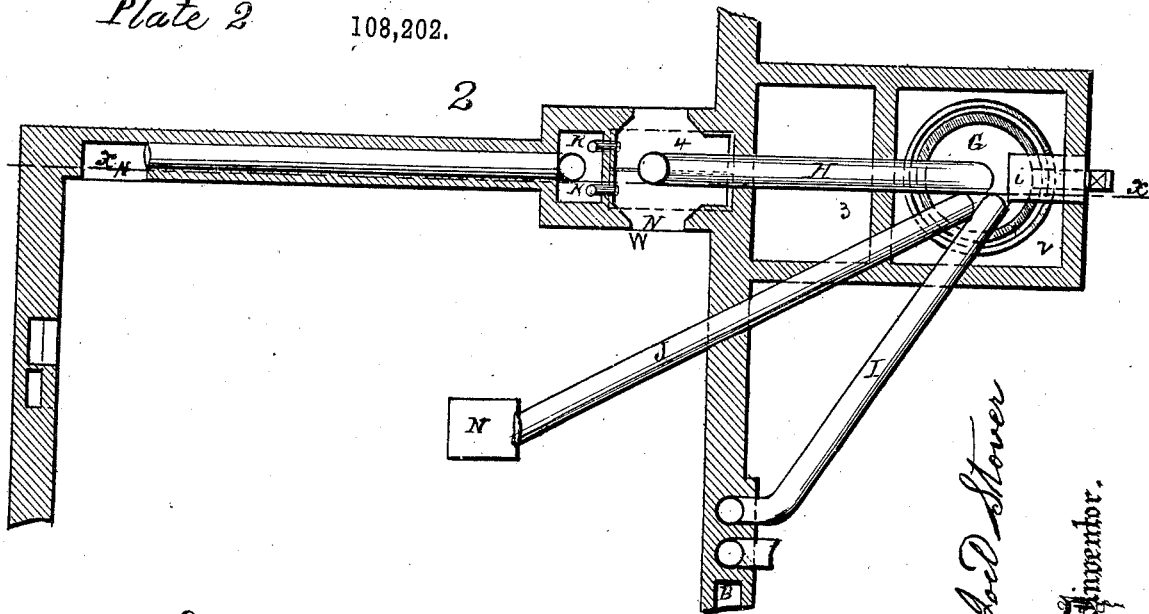
Fig 1

PATENTED OCT 11 1870



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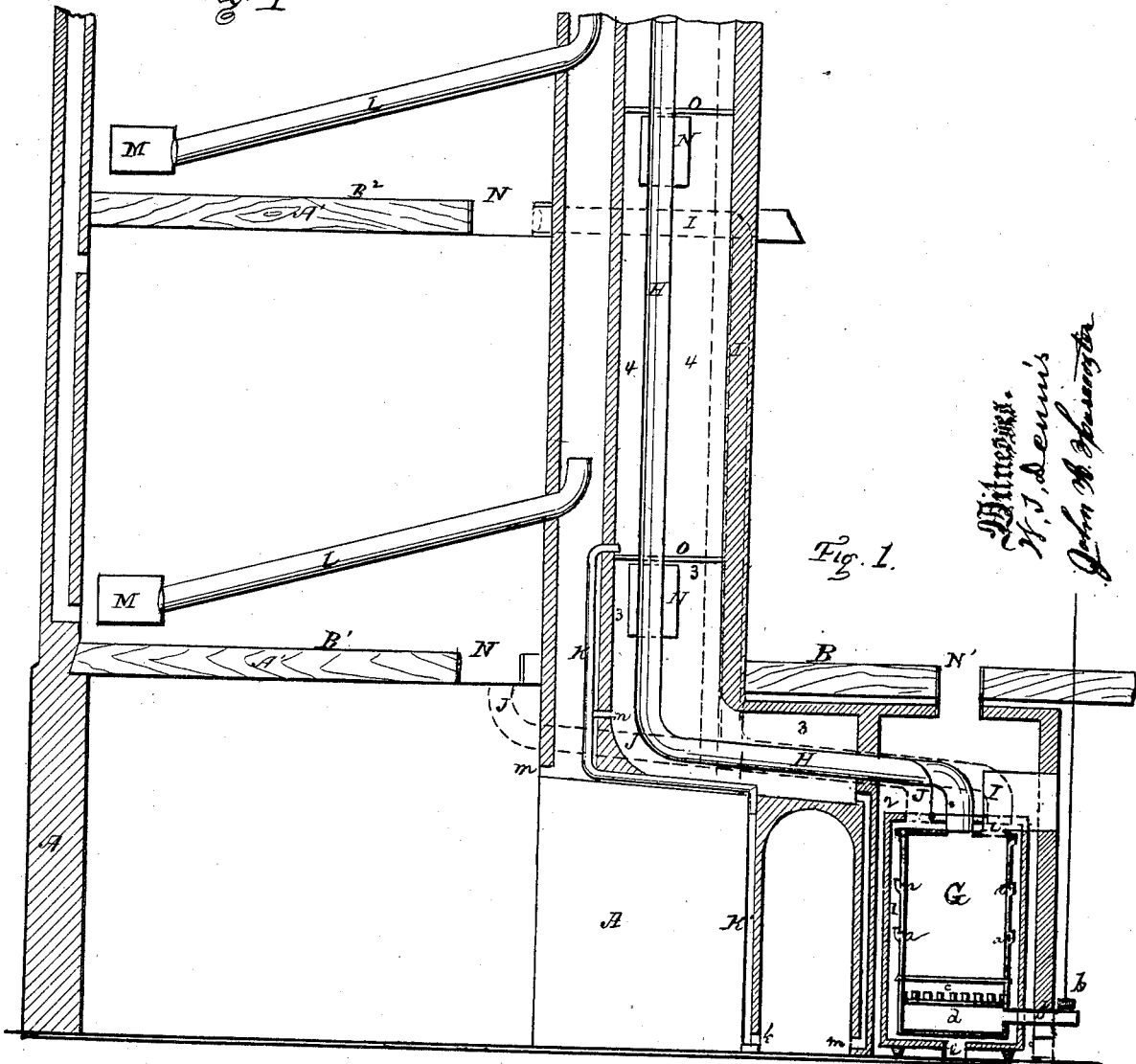
Joel Stover's Improved Fire-Proof  
apparatus for Heating & Ventilating Buildings.  
Joel Stover  
Inventor.



*Geo D Stover*

*Inventor.*

*Fig 1*



*Fig. 1.*

*Witnesses.*  
*W. J. Dennis*  
*John H. Springer*

# UNITED STATES PATENT OFFICE.

JOEL STOVER, OF RICHMOND, INDIANA.

## IMPROVEMENT IN APPARATUS FOR HEATING AND VENTILATING BUILDINGS.

Specification forming part of Letters Patent No. 108,202, dated October 11, 1870

### *To all whom it may concern:*

Be it known that I, JOEL STOVER, of Richmond, Indiana, have invented certain new and useful Improvements in Apparatus for Heating and Ventilating Buildings; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the drawings which accompany this specification, and which form a part of the same, and to the letters of reference marked thereon, in which—

Figure 1, Plate 1, is a perspective view showing the furnace in the basement, and the arrangements and devices for heating and ventilating on the first and second stories of a building. Fig. 1, Plate 2, is a vertical sectional view taken at the line shown in red, *x x*, as seen on Fig. 2, Plate 2. Fig. 2, Plate 2, is a top view of the furnace, chambers, and pipes which I employ in my invention.

Like letters of reference refer to like parts in the drawings and specification.

To enable those skilled in the art to construct and use my said invention, I will proceed to describe the same.

In the drawings, Plate 1, Fig. 1, *A A A* represent the walls of a building, and *B B* represent the floors of the same. *C C* represent the basement of the building, in which the furnace *D* is placed, and *E E E* are flues built in the walls *A A*. *F F* are ventilating-openings, which communicate with the flue *E*, and are placed in the walls near the ceiling of the room. It will be seen, however, that *D* in Fig. 1, Plate 1, is only the representation of the outside fire-proof casing of the furnace, and the construction and object of the same will more particularly appear in the explanation of Plate 2, Fig. 1.

In Plate 2, Fig. 1, *G* is a furnace of circular form, and constructed of a series of concentric rings formed with shoulders *a a a a*, which can be made of any requisite size or height. Surrounding this furnace is an air-chamber in which hot air is generated, (marked 1,) and which is carried by means of a pipe, *I*, up through an opening in the wall to the second floor, *B'*, where it is discharged into a register-box, *N*, from whence it is admitted into the room, as may be desired, to produce the required temperature. The furnace *G* is provided with a chimney, *H*, affording the necessary draft as well as the means of carry-

ing off the products of combustion. This chimney passes upward through the proper flues in the wall, and serves to heat chambers 2, 3, and 4, as seen in Fig. 1, Plate 2. Outside of chamber 1, and within the shell of the fire-proof casing *D*, is air-chamber 2, having its conductor-pipe *J*, and connecting with register-box *N* on the first floor, *B'*.

*A' A'* represent the joists or framings which constitute the floors *B' B'*. Another air-chamber (marked 3) receives its heat radially from the furnace *G*, and is outside of and in a measure dependent upon 1 and 2 for its heat, but differs from them in receiving heat from the chimney *H* and the pipe *J*, which connects with the floor *B'* by means of the register-box *N*.

*W* is a rectilinear flue built to the inner surface of the wall, and provided with a division-wall which constitutes two separate and distinct perpendicular openings, the bases of which are in the basement. The two flues included in *W* are provided with openings *N N* for register-boxes, and they also contain the chimney *H* and receive the ventilating discharge-pipes *L L*, the lower ends of which are connected with ventilator-boxes *M M*, placed at or near the floors *B' B'*, for the purpose of elevating the strata of colder air superincumbent upon the floors of the rooms. It will be observed that the currents of warmer air ascending in the openings of *W* will create a draft, which, operating through the pipes *L L*, will drain the lower portions of the room through the ventilator at or near the floor of cold or noxious atmosphere, while the register *N* will supply the deficiency warm with air—as, for instance, on floor *B'* by the pipe *J* from air-chamber 2.

The furnace *G* may be constructed in the ordinary form, or may be composed of a series of rings, as indicated by reference-letters *a a a a*, with grate-bars *c* and ash-pan *d*. The lower portion of the furnace is supplied with the necessary draft of air by the opening *b'*, which is capable of being regulated by the valve *b*, Fig. 1. The rod regulating this valve may be of any required length, and operated from the basement or any one of the floors above.

In the chambers 3 and 4, which are contained in the perpendicular casing or flue *W*, are horizontal plates *O O*, which serve as division-

plates, checking the ascending currents of heated air and securing the delivery of the same into the apartment to be warmed through the register-boxes, as shown at N N.

M M are ventilating-boxes placed in the side walls of the apartment at or near the floor, and connected with which are pipes or tubes L L, inclosed in the walls, and which are placed at such an angle as will give the requisite circulation and draft, and which have their discharge in one of the apartments of the flue W.

The pipes or tubes H J I, as shown in the top view, Plate 2, Fig. 2, indicate the manner of connecting the heating devices with the different rooms or apartments, and in connection with the separate and independent air-chambers surrounding the furnace, from which they receive the supply of heated air. By this arrangement different apartments in the same building can be kept at different grades of temperature, as may be desired.

In Plate 2, Fig 1, there are openings *m m m*, which indicate air-vents or supply-openings for either warm or cold air, as they may be situated.

The object of my invention is to provide a cheap and easy method of warming buildings, and to insure an economical use of all the heat which may be generated; and in the second place I provide for the ventilating of rooms by means of the currents of heated air which are used in warming the rooms; and in the third place I provide for the connection of the rooms by means of separate pipes with the different chambers which surround the furnace, and all of which are inclosed within the

fire-proof casing of the same, by which separate and fully independent temperatures may be easily regulated and maintained in the different rooms of any dwelling or other building.

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

1. The independent chambers 1, 2, 3, and 4, in combination with the furnace G and the chimney H, as and for the purposes herein set forth.
2. The double flue W, the ventilating-openings F F, and the register-boxes N N, in combination with the chimney H and the chambers 3 and 4, substantially in the manner and for the purposes herein set forth and described.
3. The pipes L L, as shown, the ventilating-boxes M M, the division-plates O O, and the register-boxes N N, when arranged, combined, and operated in the manner and for the purposes herein set forth and described.
4. The arrangement and combination of the furnace G, the air-chambers 1, 2, 3, and 4, the valve *b*, the opening *c*, and the chimney H, in the manner and for the purposes set forth.
5. Constructing a furnace surrounded with air-chambers 1 and 2, and incased in fire-proof covering of any desired material, by which the furnace is disconnected, from any outside inflammable material, in the manner and for the purposes herein set forth and fully described.

JOEL STOVER.

Witnesses:

W. T. DENNIS,

JOHN A. HARVESTER.