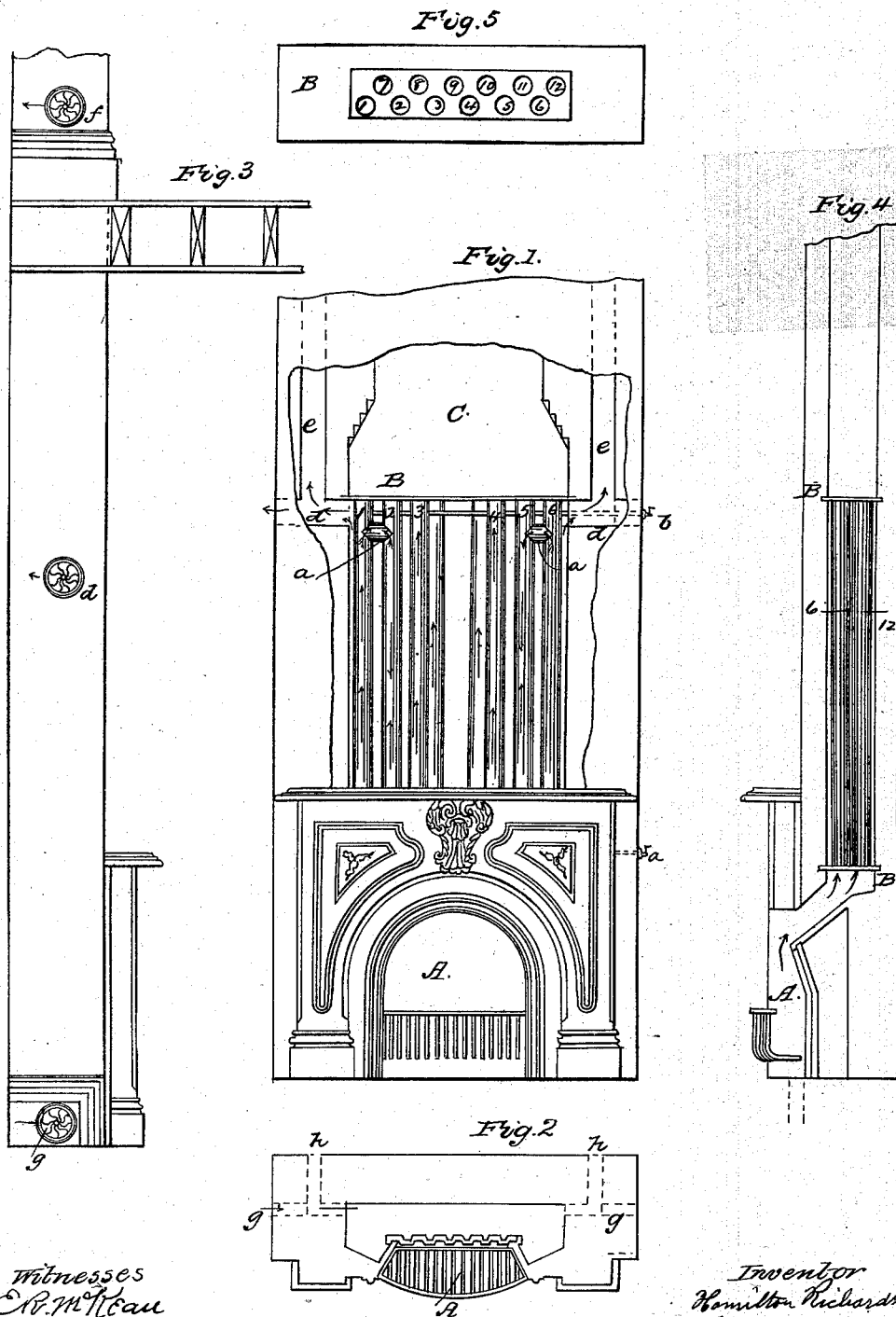


H. RICHARDSON.
Apparatus for Heating Buildings.

No. 47,569.

Patented May 2, 1865.



Witnesses
C.R. McKean
P.T. Dodge.

Inventor
Hamilton Richardson
By Smith & Dodge
his attorneys

UNITED STATES PATENT OFFICE.

HAMILTON RICHARDSON, OF JANESVILLE, WISCONSIN.

APPARATUS FOR HEATING BUILDINGS.

Specification forming part of Letters Patent No. 47,569, dated May 2, 1865.

To all whom it may concern:

Be it known that I, HAMILTON RICHARDSON, of Janesville, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in the Method of Warming Houses; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making part of this specification, in which—

Figure 1 is a front elevation with a portion broken away in order to show the interior arrangement. Fig. 2 is a plan view of the lower portion; and Figs. 3, 4, and 5 are views showing the details.

The nature of my invention consists in an arrangement of devices by which the lower portion of a chimney and the space surrounding the back and sides of the fire-place are converted into a hot-air chamber for the reception and retention of the heat generated by the combustion of the fuel, and, in connection with said chamber, my invention further consists of a series of flues and dampers or registers for admitting cold air to the chamber, and for permitting the escape therefrom of hot air into any desired room or compartment, either above or below.

It also further consists in providing the hot-air chamber with a series of pipes and dampers for radiating and retaining the heat in said chamber, so as to prevent its escape up the chimney, in the usual manner, and also for regulating the draft of the fire at pleasure.

To enable others to construct and use my invention, I will proceed to describe it.

As usually constructed, the fire-place is built with its throat entering the lower end of the chimney direct, the chimney itself being simply a tube extending to or above the roof and opening directly into the atmosphere outside of the building. It is obvious that in such cases a very large proportion of the heat from the fire will pass directly up and out of the chimney, and thus be lost. In such cases also there are no means of regulating the draft nor of supplying oxygen to the fire except from the air of the room. It is to obviate these evils or defects that my invention is intended, and I propose to do so by the following means:

I first construct a fire-place with its sides

and back composed of iron, soapstone, fire-brick, or other suitable material, which is represented by A in Figs. 1, 2, and 4. Between the back and sides of the fire-place and the chimney or wall in its rear I leave a space forming a hot-air chamber, as clearly shown in Figs. 2 and 4.

Immediately above the fire-place I make the chimney wider than usual internally, and place therein a series of tubes, 1 2 3 4 5 6, &c., which tubes may be made of sheet-iron or other suitable material, and are connected both at top and bottom by plates or diaphragms B B, as shown in Figs. 1, 4, and 5. These plates B B are made of a proper size to fill the entire opening of the chimney transversely, their edges being suitably embedded in or otherwise secured to the brick-work. These tubes being open at both ends, it follows that the smoke and heat from the fire will pass directly upward through them into the chimney above, and from thence out of the chimney in the usual manner; but while thus passing, a large portion of the heat will be radiated from the tubes into the chamber surrounding them, and unite with that which ascends from the hot-air chamber surrounding the fire-place below, there being an opening at each side of the fire-place near its top uniting the hot-air chamber above with that below. In this condition it is obvious that the draft will be directly upward through the whole series of pipes, and that much of the heat will still escape up the chimney.

For the purpose of more completely utilizing the heat I connect the two outer pipes on each side—1 2 on the left and 5 6 on the right in Fig. 1—by a short cross pipe, *a*, near the top. The pipe or tube 2 is then connected to the next one of the series, which in this case is marked 3, by a similar cross pipe located near their lower end, too low to be shown in the drawings, and in like manner tube 5 is united to 4. A valve-rod, *b*, extends across the chimney, passing through the series of tubes, and on this rod is mounted a valve in each of the pipes or tubes 1 2 5 6. A similar rod, *c*, is located at the lower end of the tubes, on which is mounted a similar valve in the tubes 3 4, the upper valves being located above the upper cross-pipes *a*, and the lower valves being located below the lower cross-pipes in a similar manner. By turning the upper rod, *b*, so as to close the tubes 1 2 and 5 6, and then turning

rod *c* so as to close the lower ends of tubes 2 3 and 4 5, it is obvious that the heat and smoke ascending from the fire-place will be compelled to take the course indicated by the red arrows shown in Fig. 1, first passing up tubes 1 and 6, down 2 and 5, and then up 3 and 4, from whence the smoke will emerge and pass off out the chimney, almost the whole of the heat being radiated from the pipes into the hot-air chamber by the time the smoke makes its exit from the pipes. A second series of pipes, arranged like those already described, is shown placed in rear of the series above described, and any number of pipes may be thus arranged, according to the capacity of the chamber in the chimney. The tubes and valves also serve the purpose of regulating the draft at will. It is necessary when a fire is first started that there shall be a strong and unobstructed draft, and this I produce by so turning the valves as to open all the pipes, when the smoke will ascend through them all direct, as indicated by the black arrows. After the coal is thoroughly ignited and the cold air expelled from the chimney, so as to insure a sufficient draft and prevent smoking, the valves may be turned, as above described, and the heat retained in the hot-air chamber. A flue or passage, *d*, is made on either side of the chimney-opening from near the top of the hot-air chamber out into the room, as shown in Figs. 1 and 3, through which the hot air may pass from the chamber into the room, a register being provided, as shown in Fig. 3, to regulate its admission into the room or to shut it off entirely, as desired. Another flue, *e*, is made in each side wall of the chimney, as shown in Fig. 1, its lower end opening into flue *d*. These flues *e e* extend upward above the ceiling of lower rooms and open out into the rooms above, as shown at *f*, Fig. 3, where they are also provided with registers to shut off or regulate the admission of heated air. If more than two stories are to be heated, one of the flues *e* may end at the second story, and the other extend up to the third, or both may extend to the third, or even higher, if there be more stories, and have a register for each story.

Near the bottom of the fire-place a passage, *g*, Fig. 2, is shown, opening at one end into the room and at the other into the hot-air chamber surrounding the fire-place. Another flue, *h*, is also shown, connecting these flues with the air outside of the wall of the building, both of which passages *g* and *h*, are provided with registers, as shown at *g*, Fig. 3. By these means cold air may be admitted at pleasure either from the room or from outside the building, as circumstances shall dictate. In very cold weather the passages *h* may be closed, and those marked *g* opened, which will cause the cold air near the floor of the room to flow into the hot-air chamber, and causing the hot air coming into the room from flues *d* to descend and take the place of the cold air thus drawn off, thus also insuring a

thorough circulation and equalization of the atmosphere in the room. In summer, when no fire is needed, fresh air may be admitted through flues *h* into the hot-air chamber, from whence it may be admitted into the lower rooms through flues *d*, and also through flues *e* into the rooms above, the registers being properly adjusted for that purpose, whereby the rooms may be kept thoroughly ventilated and supplied with fresh air, and at the same time avoiding the currents or drafts caused by opening the doors or windows in the usual manner.

To render the system more complete I propose to furnish the fire-place with a metallic front made to fit snugly therein, by which it may be entirely closed, and thus convert the fire place into a stove at will, this movable front being provided with a suitable damper or register, so that the fire may be regulated as desired. By this means the fire may be rendered more secure at night, and may also be kept for a much longer time than by the usual arrangement.

In the hearth underneath the grate I propose to locate a movable metallic plate or door, by the removal of which the ashes from the grate will be allowed to pass down through an opening into a suitable ash house or receptacle located in the cellar underneath, from whence they can be removed at pleasure. In this way I avoid the dust and litter caused in the room by the shoveling and removing of the ashes and cinders in the usual manner. If desired, a grate may be placed over this opening, underneath the sliding plate, to prevent cinders and coals from passing down with the ashes.

In constructing the tubes and chimney care should be taken to have the cross-area of the chimney exactly equal to that of the tubes, in order to secure a regular and perfect draft and prevent smoking. It is for this purpose that the chimney *C* is contracted immediately above the tubes, as shown in Fig. 1.

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

1. The series of radiating-pipes 1 2 3, &c., arranged in a hot-air chamber within the chimney, and so provided with cross or connecting pipes and valves that the draft may be varied at pleasure from a direct to an up and down draft, substantially as and for the purposes herein set forth.

2. In combination with the hot-air chamber above described, the flues or passages, *d* and *e*, constructed and arranged to operate substantially as and for the purpose set forth.

3. In combination with the hot-air chamber above described, the flues or passages *g* and *h*, for the purpose of admitting cold or fresh air from the room or from outside of the building, as herein set forth.

Witnesses: H. RICHARDSON.
W. C. DODGE,
E. R. MCKEAN.