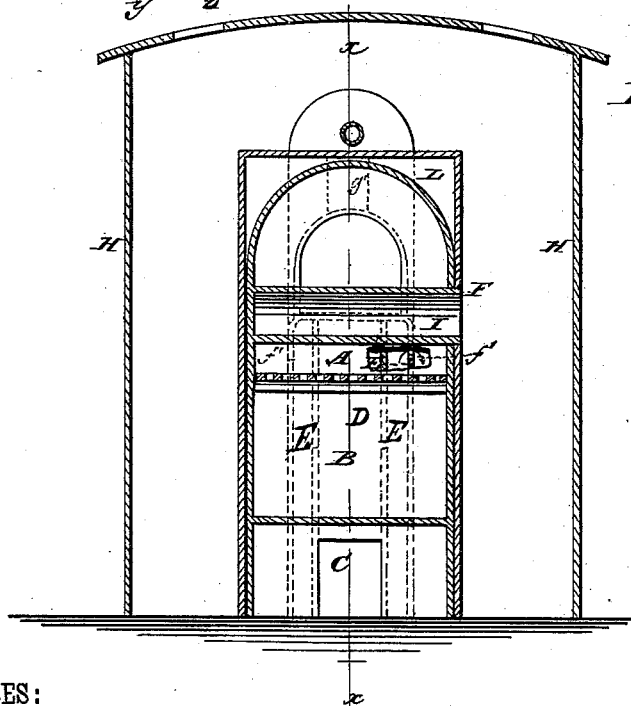
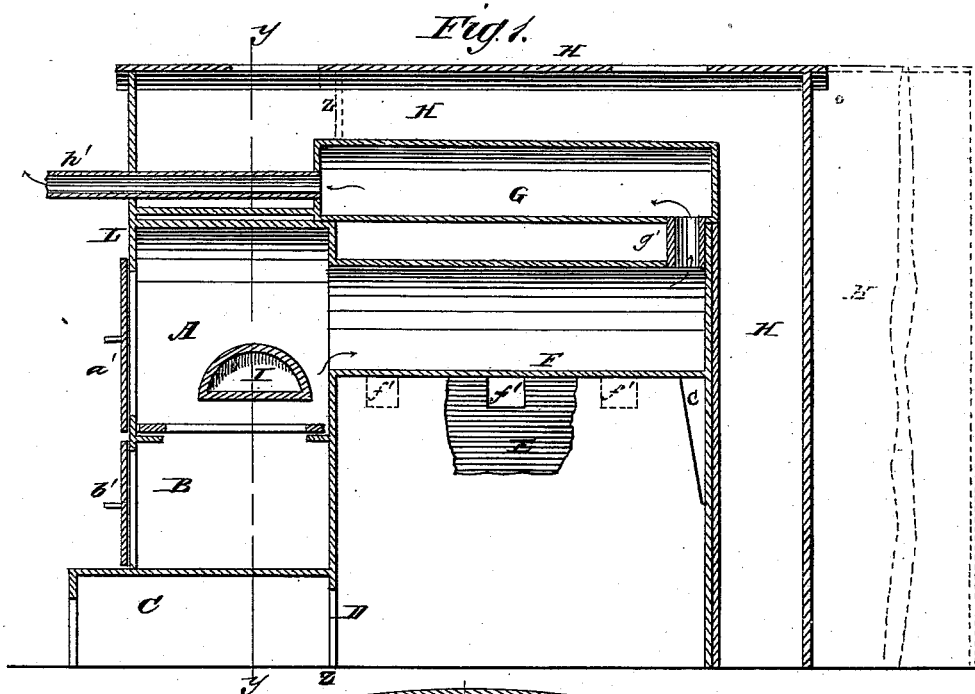


T. CROOKE.
Hot-Air Furnace.

No. 214,629.

Patented April 22, 1879.



WITNESSES:

Francis McArdle.
C. Seaguirick

INVENTOR:

T. Crooke
BY *Mumford*

ATTORNEYS.

UNITED STATES PATENT OFFICE.

THOMAS CROOKE, OF NEWARK, NEW JERSEY.

IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. **214,629**, dated April 22, 1879; application filed January 20, 1879.

To all whom it may concern:

Be it known that I, THOMAS CROOKE, of Newark, in the county of Essex and State of New Jersey, have invented a new and Improved Hot-Air Furnace, of which the following is a specification.

Figure 1 is a longitudinal vertical section on line *x x*, Fig. 2. Fig. 2 is a vertical cross-section on line *y y*, Fig. 1.

Similar letters of reference indicate corresponding parts.

The object of this invention is to provide a hot-air furnace, constructed entirely of refractory bricks or clay, which may be used independently of or in combination with a hot-air chamber.

In the drawings, A denotes the fire-place or combustion-chamber, which is provided with any suitable grate, and supplied with fuel in the usual manner through the door *a*'. Below this is the ash-pit B, with door *b*', and below this still is the air-pipe or opening C, for the admission of air to become heated by contact with the heated surfaces of the furnace.

The air may be admitted at some other point, if it be more convenient to do so, or at additional points, if desired.

Passing through the opening C the current of air flows into the inner chamber, D; thence through a communicating opening, *e*, in its rear into chamber E, where it comes in contact with the bottom of the lower flue, F, of the furnace, and thence out at the ports *f' f' f'*, moving upward in contact with the clay flues F and G, which serve both as flues and radiators. A short section of pipe, *g*, connects the two flues at their rear ends, and another section, *h*', projects from the front of the upper flue, thus making a complete and continuous passage.

For the heating of dwelling-houses I usually surround the furnace with a box or chamber, (shown at H,) from which pipes, connecting with openings at its top, shall convey the heated air to different parts of the house. In these cases the furnace is usually entirely inclosed by the chamber, the door-plate L being flush with the front wall of the chamber. Within the fire-place will be seen a small retort, I, set well above the grate, and having its open end flush with the outside of the side

wall of the fire-place. When there is a fire in the furnace this retort will be heated, and the use of it would be both economical and convenient to the housekeeper for warming or cooking food. Consequently, when it is desirable, I set the retort within the fire-place, as shown, and build the chamber H so that its front wall shall close upon the furnace on line *z z*, leaving the fire-place projecting from it.

This arrangement of the small retort and the method of setting the furnace are especially adapted to hat-factories, book-binding works, laundries, tin and copper smith's work, &c., as the heated retort furnishes a most convenient means of heating the irons used in the various industries referred to.

In some instances, when setting the furnace in a large workshop or other room, which alone it is intended to heat, I dispense altogether with the surrounding chamber H, for the sake of economizing both space and money. Being constructed entirely of bricks and clay, with the exception of doors, door-frames, and grate-bars, this furnace is eminently free from the many objections which attach to the use of cast-iron furnaces. Its superiority is manifest in its lower cost, its durability, the ease of repairing it, in the prevention of the escape of the deleterious gases of combustion, and in the softer or more tempered heat it imparts to the air.

I do not confine myself to two as the number of flues or retorts used in the construction of this furnace, for, for large furnaces, three or more may be more suitable.

I am aware that hot-air furnaces of many designs have been patented and constructed, and some, perhaps, that may resemble mine in general features, yet differ from it in essential points. In this connection my attention has been called to the invention of George E. Wallis, patented April 20, 1875.

It will be seen on comparison of the two that Wallis causes the supply of cold air to pass through pipes, (gas-tubing) which pass through the combustion-chamber and the drums or flues.

It is obvious that the pipes in the combustion-chamber must, as air carrying moisture constantly passes through them, oxidize or burn out in a very short time, and cause much

trouble and expense; and that the pipes passing through the drums or flues must cause considerable deposit of soot and ashes, which will interfere with the draft, and, themselves becoming coated with the deposit, (which is a non-conductor of heat,) will soon cease to perform the duty required.

All these points, which are objectionable in principle and practice, I have especially avoided in my design; and, further, I construct my furnace so that it is complete in itself without the surrounding air-chamber, and in many instances will be preferably so used.

The retort in the fire-place, too, is a feature not possessed by any hot-air furnace with which I am acquainted.

I do not confine myself to this particular shape of retort-flue, for in some instances I may make them of octagonal or other shape.

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

1. The hot-air furnace, consisting of fire-place A, ash-pit B, air passages or chambers C, D, and E, flues F and G, and sections of pipe *g'* and *h'*, all constructed of clay or bricks, substantially as herein shown and described.

2. The fire-place A, ash-pit B, air passages or chambers C D E, flues F G, and sections of pipe *g' h'*, in combination with the surrounding chamber H, substantially as and for the purpose described.

THOMAS CROOKE.

Witnesses:

C. SEDGWICK,
J. F. STOVER.