J. P. GILL.

APPARATUS FOR HEATING.

No. 178,760. Patented June 13, 1876.

Fig. 1.

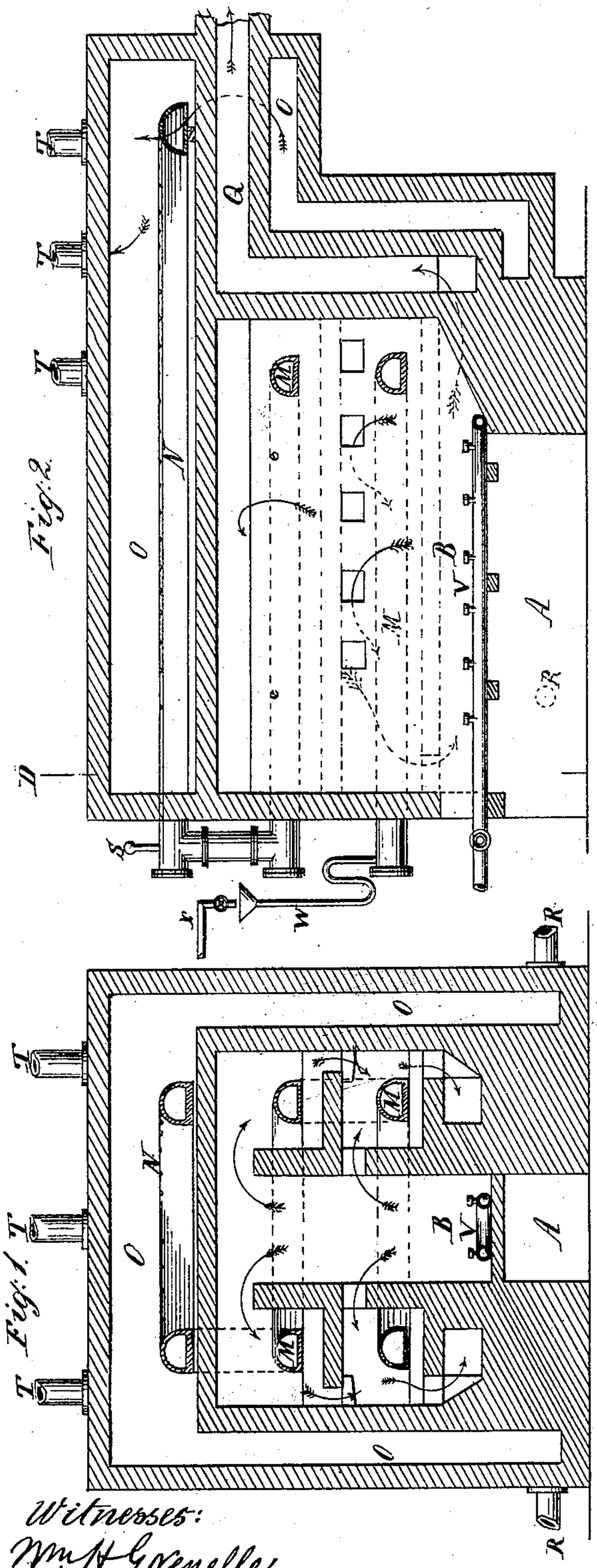

Fig. 2.

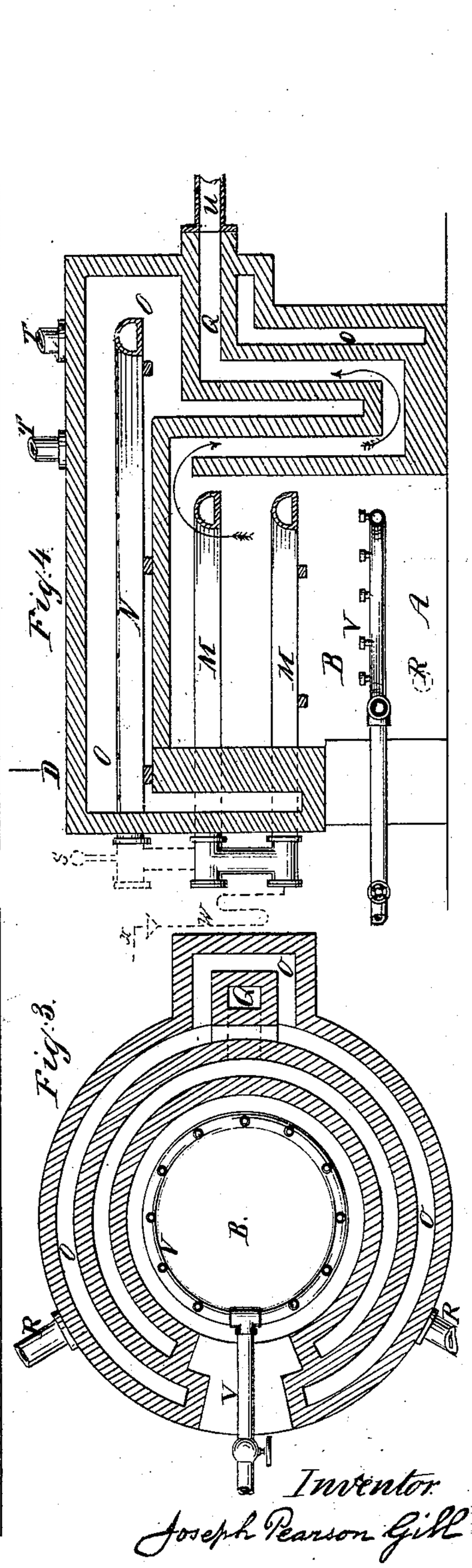

Fig. 3.

Witnesses:
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JOSEPH PEARSON GILL, OF NEWARK, NEW JERSEY, ASSIGNOR TO ROBERT W. RUTHERFURD AND JOSEPH P. GILL, TRUSTEES OF THE ILLUMINATING GAS APPARATUS CONSTRUCTION COMPANY, OF NEW YORK.

IMPROVEMENT IN APPARATUS FOR HEATING.

Specification forming part of Letters Patent No. **178,760**, dated June 13, 1876; application filed December 3, 1875.

To all whom it may concern:

Be it known that I, JOSEPH PEARSON GILL, of the city of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in an Apparatus for Heating and Ventilating Purposes; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The nature of my invention consists in improvements in warming and ventilating dwellings and public buildings, by the combination of superheated steam at a high temperature with heated air in an apparatus or furnace having generators, superheaters, and distributing-chambers connected by steam-pipes, said furnace being heated by hydrogen gas or other fuel, as hereinafter described.

The means employed by me are illustrated in the accompanying drawing, which is hereby made part of this specification.

Referring to the drawing, Figures 1, 2, 3, and 4 represent the furnaces heated in part by hydrogen gas and superheated steam. Fig. 1 is a section of the brick furnace across the front through D. Fig. 2 is a longitudinal section. Fig. 3 is a cross-section of the iron furnace. Fig. 4 is a longitudinal section of the iron furnace.

These furnaces are provided with an air-space, O, surrounding the sides and top, and extending several feet to the rear of them, as shown in the drawing. Over the fire-place, and below the upper air-space, are a series of pipes or tubes, M, for converting water into steam, and then superheating the steam. The superheater is maintained at a red heat. A pipe, N, from the superheater M passes from the front to the rear of the upper air-chamber to heat the air therein. There are a number of small holes in the pipe N to allow of sufficient superheated steam to escape to moisten the warm air and prepare it to be breathed. Superheated steam, of a temperature of, for instance, 800° Fahrenheit, escaping into the heated air assists in heating it and in a proper distribution of the heat, and at the same time, on becoming cool, gives the requisite degree of moisture to the air. The passage Q leading from the furnace being quite hot is made to pass through the air-chamber O, thus further assisting to warm the air, the products of combustion then passing through the pipe U to the chimney. The cold air from the exterior of the building is supplied to the air-chamber at the openings R, near the bottom of the sides of the furnace, by means of the usual cold-air pipes, and the air is heated in the four ways mentioned, viz: from the sides, rear, and top of the furnace, by the superheated steam-pipe N, by the superheated steam escaping through the small holes in the pipe N and commingling with the air, and by the passage Q. The temperature of the superheated steam is ascertained by means of the pyrometer S.

By means of this apparatus air properly warmed and moistened, and uninjured by being burned, can be delivered in quantity sufficient to thoroughly warm and ventilate buildings of any size or description.

Hydrogen is admitted to the furnace by means of a pipe, V. Water is admitted to the superheater M through the siphon-pipe W, which also acts as a safety-valve to the superheater. Water is let in to the siphon W by means of the valve X, or of an automatic arrangement, in such regulated quantity as may be required for use.

In cases where a boiler is employed on the premises, the siphon W may be dispensed with, and steam admitted directly into the superheater.

The hot air is distributed to the different apartments through the outlet pipes or flues T. The fire-places of these furnaces and stoves are so constructed that in case of failure in the supply of, or inability to obtain, hydrogen or heating gas, the gas-pipes may be removed,

and coal, coke, or other solid or liquid fuels may be used instead thereof, or, when obtained, in combination therewith.

Referring to the drawings, similar letters in Figs. 1, 2, 3, and 4 indicate similar parts.

A indicates the space answering to ash-pit. B indicates the fire place. V indicates the hydrogen pipe and burners. Q indicates the flue from furnace. U indicates the pipe leading from flue to chimney. O indicates the air-chamber around the furnace and flue. M indicates the superheater. N indicates the pipes from superheater in upper air-chamber. S indicates the pyrometer. W indicates the siphon-pipe for supplying the water to superheater. X indicates the valves regulating the supply of water to W. T indicates the flues conducting the hot air to the different apartments.

What I claim, and desire to secure by Letters Patent, is—

1. The process of warming and ventilating dwellings and public buildings by admitting and diffusing superheated steam at a high temperature into atmospheric air heated in the air-chamber of a furnace, the steam being superheated in a superheater or chamber in the furnace, separate and apart from the boiler or chamber in which the steam is generated, the two chambers being connected by a suitable pipe, and the superheated steam being admitted into the air in the air-chamber of the furnace in fine streams through small holes in the distributing pipe or chamber, thus becoming intimately commingled with the air, and imparting to it its excess of heat, substantially in the manner as herein described, and for the purpose set forth.

2. In a hot-air furnace, a combination of the lower steam-generator surrounding the fire-pot, and a steam superheater placed in the combustion-chamber, and a steam-distributing chamber or pipe, provided with fine perforations, substantially in the manner as herein described, and for the purpose set forth.

3. In an apparatus for heating and ventilating dwellings and public buildings, the combination of ash-pit space A, fire-place B, hydrogen pipe and burners V, flue Q, pipe U, air-chamber O, superheater M, pipe N, pyrometer S, siphon-pipe W, valve X, outlets T, constructed, arranged, and adjusted substantially in the manner herein described, and for the purpose set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JOSEPH PEARSON GILL.

Witnesses:
WM. H. GRENELLE,
B. LEWIS BLACKFORD.