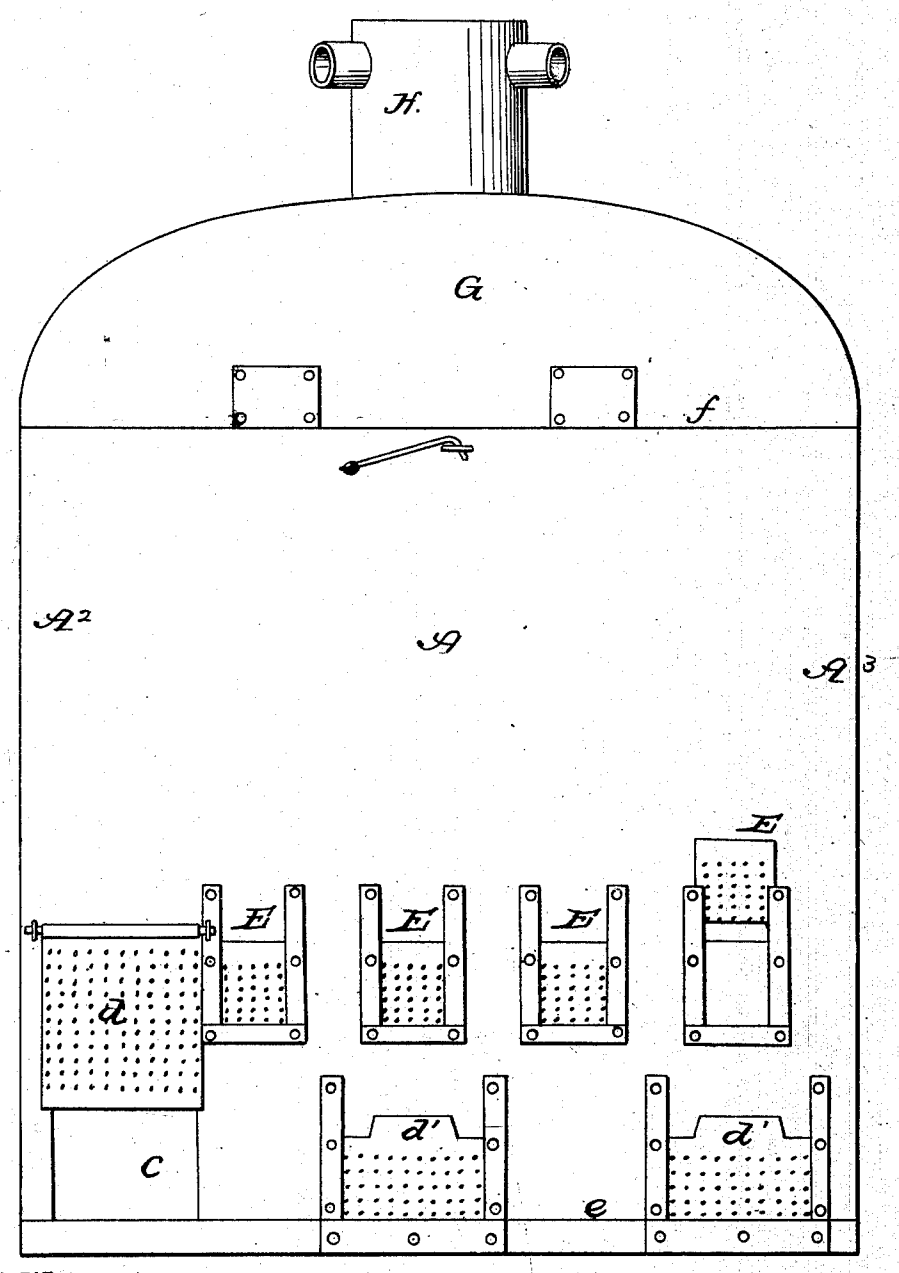
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S. WETHERED.

Hot Air Furnace.

No. 26,724. Patented Jan'y 3, 1860.

Fig. 1




Witnesses
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J J Myers

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N. PETERS. Photo-Lithographer. Washington D. C.

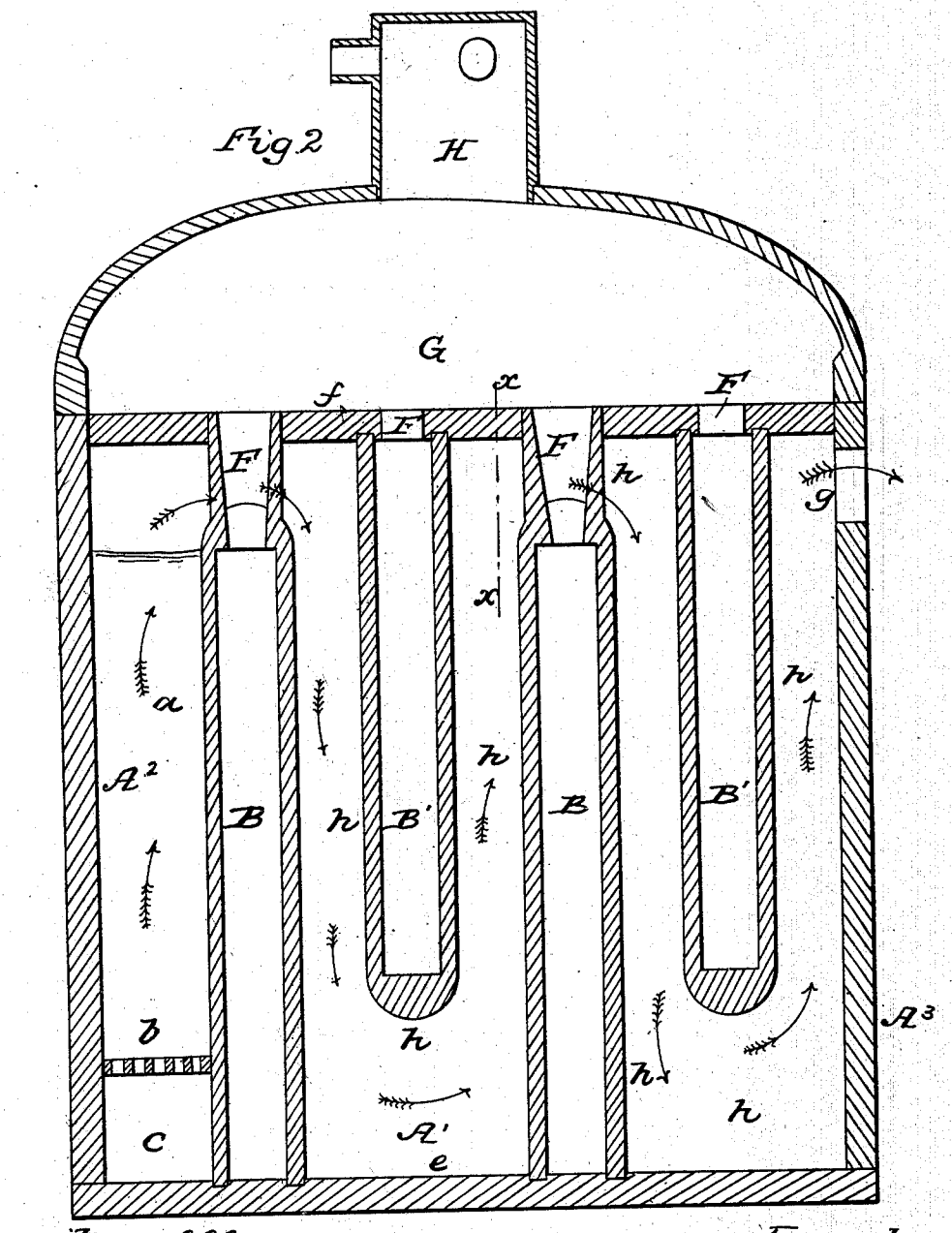
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## Hot Air Furnace.

No. 26,724. Patented Jan'y 3, 1860.

Fig 2




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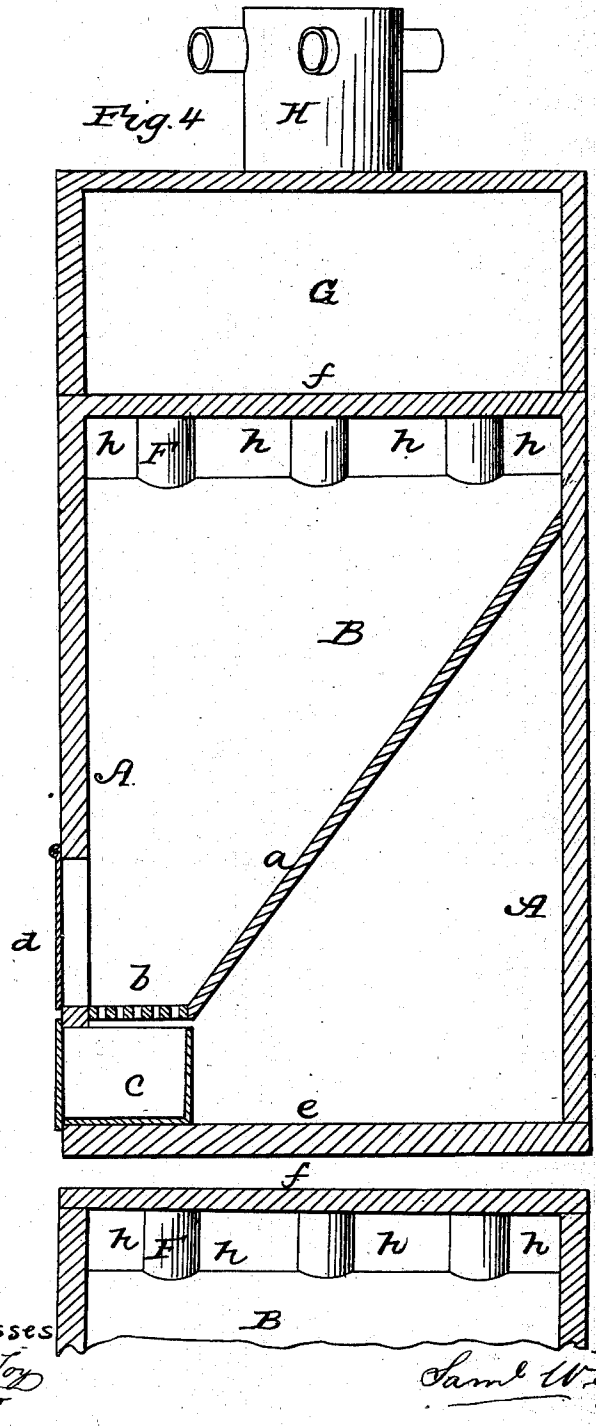
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No. 26,724. Patented Jan'y 3, 1860.

Fig. 4




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# UNITED STATES PATENT OFFICE.

SAMUEL WETHERED, OF BALTIMORE, MARYLAND.

## HOT-AIR FURNACE.

Specification of Letters Patent No. 26,724, dated January 3, 1860.

*To all whom it may concern:*

Be it known that I, SAMUEL WETHERED, of Baltimore, in the county of Baltimore and State of Maryland, have invented a new and useful Improvement in Brick Hot-Air Furnaces; 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, forming a part of this specification, in which—

Figure 1, is a front elevation of a furnace constructed after my invention. Fig. 2, is a vertical transverse section of the same, and Fig. 3, is a broken vertical section in the line *y*, *y*, of Fig. 2. Fig. 4 is a vertical longitudinal section.

Similar letters of reference, in each of the several figures, indicate corresponding parts.

The object of my invention is to render practicable the substitution of brick or other argillaceous material in the construction of hot air furnaces, for iron and thus obviate the drying and deadening effects of the latter material upon the air warmed by contact with the same or by the heat radiated therefrom. Air heated by argillaceous substances, it may be well known is supplied to the room in a more moist and healthy state than air heated by metal, as the former does not become so intensely heated as to burn the air and deprive it of moisture nor does the heat radiated therefrom, in mingling with the air, impart to it an unhealthy and disagreeable smell.

My invention consists in the combination of side registers, auxiliary side cleansing and draft apertures and an inclined fire chamber; with a furnace constructed internally of a series of hollow arches projecting alternately up from the bottom and down from the crown wall of the furnace in a manner to form a zig-zag or serpentine draft passage from the fire box to the escape pipe or chimney flue, and to form air heating chambers extending from the front to the rear of the furnace, said arches being closed in at front and rear by brick walls and supplied through the auxiliary registers with pure external cold air, and also being allowed to communicate with a hot air reservoir on top of the crown wall of the furnace by means of vertical branch pipes leading from the arches through the crown wall in such a manner as not to materially obstruct the main draft.

By the use of my inclined fire box, the necessity of using a deep bed of coal in order to have the flame pass over the first arch is avoided, for although a thin bed of coal is used, the flame will escape from the rear end of the fire box just at the top of the first arch. The combustion of the fuel will also be more certain because the bed of coal is thin and the draft will have a free passage through the same from the front of the fire box to its rear. By the use of my side registers, the cold air to be treated can be supplied in any desired quantity directly into the arches, and thus the apartments kept heated to the degree required by the temperature of the atmosphere, and by the use of my auxiliary draft and cleansing passages, the combustion of the fuel in the fire box and the circulation of the flame through the circuitous passage is rendered more perfect, and facilities for introducing a brush between the arches to remove soot are also secured.

To enable others, skilled in the art, to make and use my invention, I will proceed to describe its construction and operation.

A A′ $A^2$ $A^3$, represents the wall which incases the fire box arches etc. This wall is made of brick and may itself, if desirable, be incased so as to have an air or non conducting space all around it so as to retain the heat usually wasted by external radiation, for warming apartments. At one side or corner I construct a fire box with an inclined back plate *a*, and with a horizontal grate *b*. This fire box is furnished with an ash pit *c*, and with draft and supply door *d*, as shown. To form the inner side of the fire box, the outer side being formed by one of the side walls $A^2$, I construct an upright hollow brick arch B, from the foundation *e*, of the furnace to within a short distance of the crown wall *f*, and have the ends of the arch unite with the front and rear walls A, A′, of the furnace; at a short distance from this arch and running parallel with it I construct an inverted hollow arch B′ from the crown wall down to within a short distance of the foundation plate and have the ends of this arch unite with the front and end walls A, A′, of the furnace. And thus I continue to alternately construct upright and inverted arches until I arrive within a short distance of side wall $A^3$, of the furnace. In this

wall I form an escape or chimney passage *g*, which communicates with the serpentine or zig-zag flue *h*, *h*, *h*, leading from the fire box and formed by thus constructing the arches, as illustrated by the arrow. Auxiliary draft and soot cleaning doors are also provided in the external wall so as to communicate with the serpentine draft passage and thus facilitate the circulation of the flame through the same, and allow of a brush being introduced between the arches so as to remove the soot. Each of the arches thus constructed constitutes in itself an air heating chamber, and by its peculiar arrangement, and the inclined form of the back plate of the fire chamber, its whole outer surface is exposed to a constant heat and the air which may be in it, consequently is warmed by said heat to the proper temperature for being supplied into apartments.

E, E, are doors or cold air flues for supplying pure cold air to the interior of the arches. These doors may be perforated or constructed and arranged to slide or in any way so as to control and regulate the admission of cold air to the arches from the outside of the furnace.

F, F, are narrow hollow branch passages leading down through the crown wall into the furnace so as to communicate with the interior of the arches, B, B. These tubes are placed some distance apart as shown in the view Fig. 3, so that the heated flame may circulate between them and not be obstructed.

F′, F′ are passages leading down through the crown wall into the arches B′ B′ as shown.

G, is a brick hot air reservoir constructed on top of the crown wall of the furnace; this reservoir receives the hot air from the arches through the tubes and passages F, F×, and distributes it through a register H, into various flues leading to apartments, as illustrated or in any manner found convenient to suit the location where the furnace is put up.

Furnaces of this construction are very simple, not liable to get out of repair and will not be very costly and what is most important will supply the air in a healthful and agreeable condition.

Although it is my intention to use argillaceous materials in constructing my furnace, I do not confine myself to any material, but wish to have the right to use brick, stone, metal, &c. Therefore

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

The combination of the inclined fire box side cold air doors or registers and auxiliary side draft and cleansing passages, with a furnace constructed with a series of hollow arches which form a zig-zag flame passage from the fire box to the chimney flue and communicate by branch tubes with a hot air reservoir; all in the manner and for the purpose herein set forth.

SAML. WETHERED.

Witnesses:

SAML. D. TOY,

JAS. MEYLER.