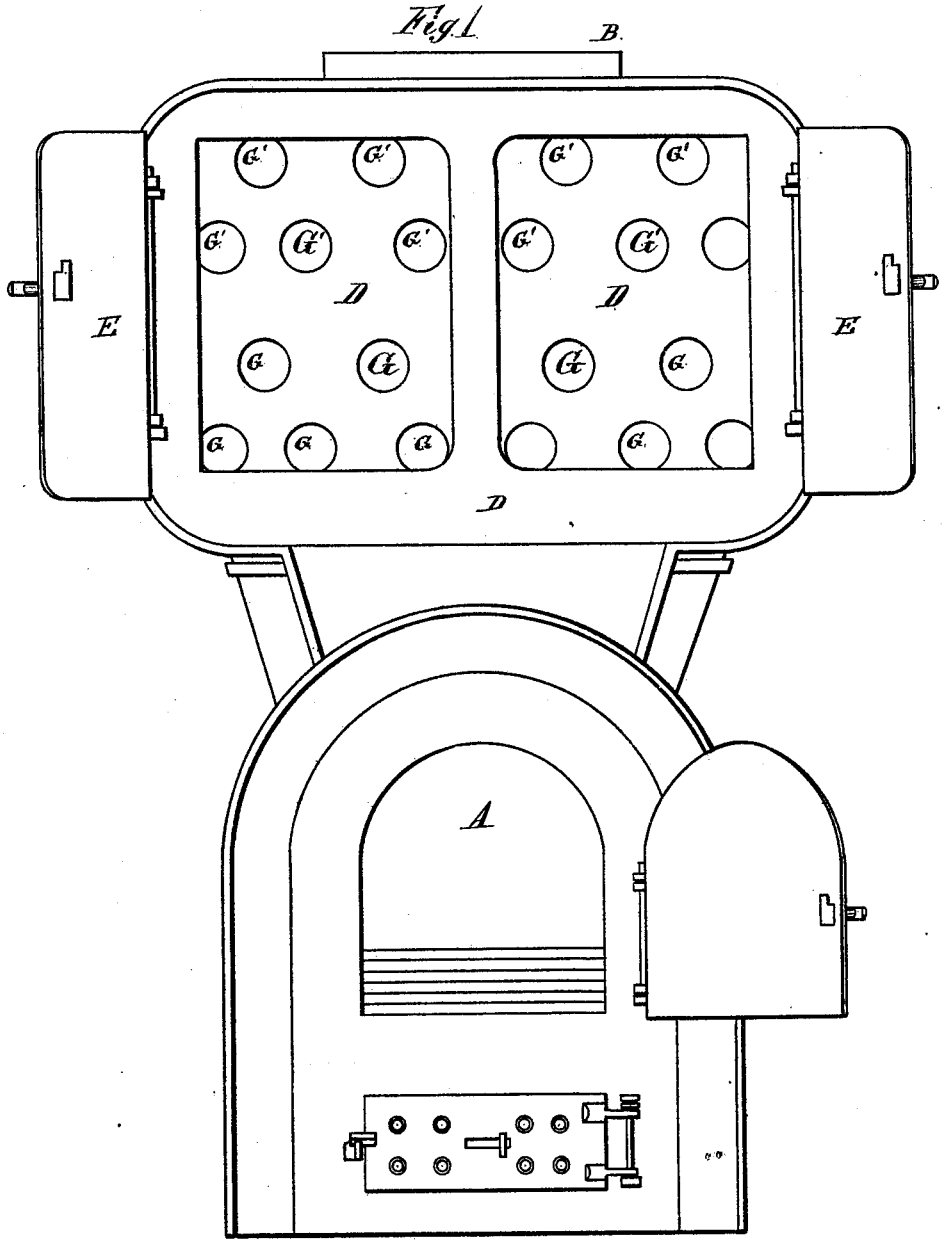
W. E. HENDERSON.

Hot-Air Furnaces.

No. 197,128. **Patented Nov. 13, 1877.**

Fig. 1.



WITNESSES:

Thomas Bernard

C. M. Searle.

INVENTOR,

William E. Henderson

Gilmore, Smith & Co.

ATTORNEYS.

2 Sheets—Sheet 2.

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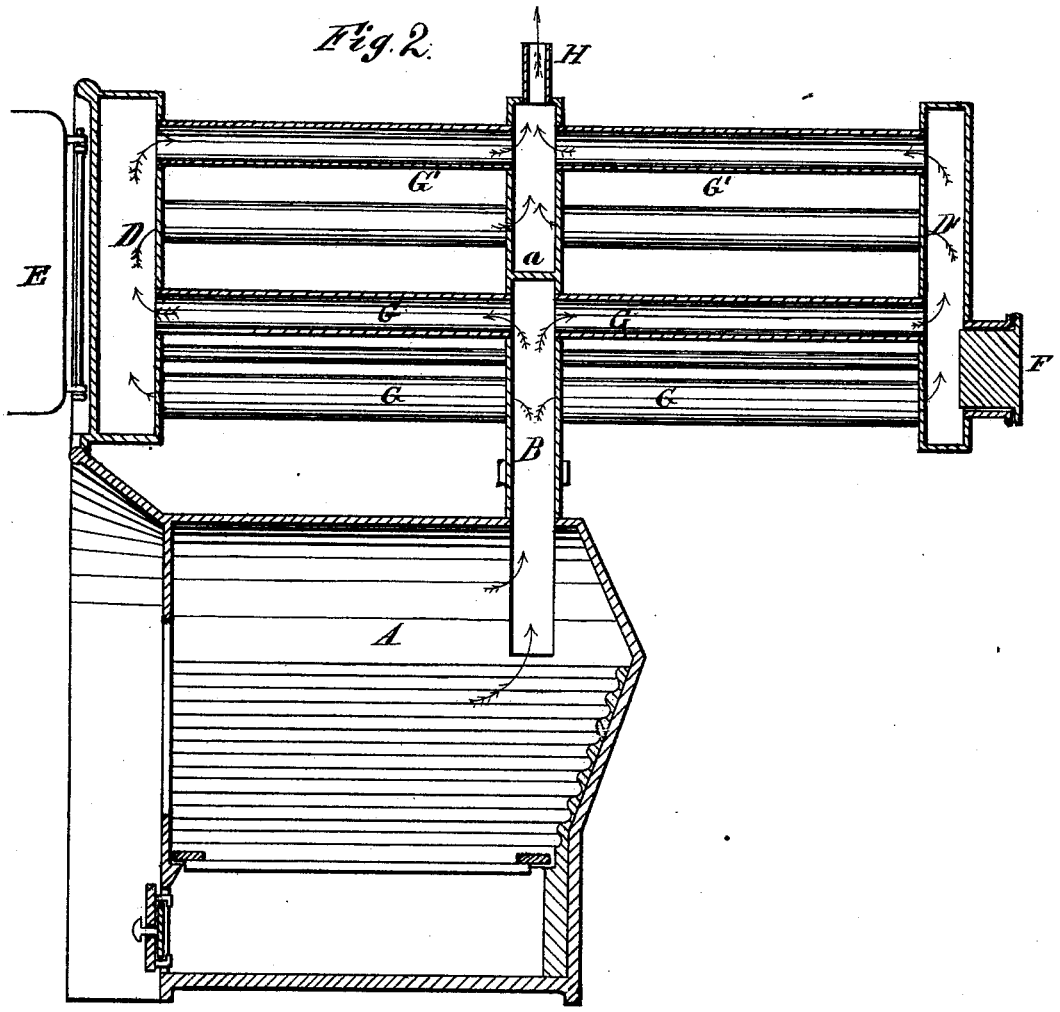
Fig. 2.



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Gilmore & Whittemore.

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UNITED STATES PATENT OFFICE.

WILLIAM E. HENDERSON, OF WINONA, MINNESOTA.

IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. **197,128**, dated November 13, 1877; application filed March 25, 1876.

To all whom it may concern:

Be it known that I, WILLIAM E. HENDERSON, of Winona, of the county of Winona and State of Minnesota, have invented a new and Improved Hot-Air Furnace; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a front elevation of my improved hot-air furnace or heater, the doors being represented open, and Fig. 2 is a sectional side view.

The invention is an improvement in a class of tubular hot-air furnaces or heaters in which a horizontal diaphragm is employed to divert or change the direction of the current of the products of combustion, and cause them to traverse two sets of horizontal flues arranged one above the other.

The improvement relates to a heater composed of two groups or systems of flues joined to a single central hollow head, and provided with hollow end heads having doors and soot discharge apertures, the arrangement of the two groups or systems of flues being such that the soot may be removed from both at the same operation and by the same instrument. A further advantage is likewise secured in the regulation of the draft by the adjustment of the doors, all as hereinafter described.

The furnace proper, A, supports the radiator, which is composed of three hollow heads, B D D′, and horizontal tubes G G′. The three tubes are arranged vertically and parallelly, and the central one is provided with a horizontal diaphragm, *a*, and thus divided into two compartments—an upper and lower. The front head D is entirely open on the front side, and provided with hinged swinging doors E for closing the same. The rear head D′ is similar to the front one, D, except that the opening in its outer side is smaller, and closed by a removable plug or slide, F.

From the lower compartment of the central head B the products of combustion pass in opposite directions right and left, through the lower tubes of each group G connected therewith, and which constitute half of the whole number of tubes, (in practice forty-four.)

The products of combustion thus conducted into the end heads D D′ ascend and pass along the upper tubes G¹ of each group, the currents reuniting in the upper compartment of the central head B, and escaping thence into the flue H leading to the chimney. The tubes composing each group being each arranged exactly opposite similar tubes in the other group, and the front head D being entirely open in the front side, a swab can be introduced and run through two tubes at once, thus effecting an economy of time and labor. The soot, which is pushed out of the tubes by the swab, will fall either into the central or rear head. That portion which falls into the rear head D′ may be removed through the opening closed by the detachable plug F. The portion falling into the lower compartment of the central head B will pass directly downward into the furnace A, and the portion collecting in the upper compartment of said head will be carried back into the rear head by the swab as it passes through from one of the aligned tubes to another.

Another advantage is derived from the combination and arrangement of the two sets of tubes, in that the doors E of the radiator can be opened while the furnace is in full operation without danger of smoke issuing therefrom into the apartment, for, in such case, the rear group of tubes conduct the smoke to the flue H, and the draft and amount of radiated heat are regulated—*i. e.*, lessened—correspondingly. It is obvious this could not be done if the radiator were composed of a single group of tubes.

What I therefore claim is—

The improved heater or radiator composed of the vertical and parallel hollow heads B D D′, provided, respectively, with the horizontal diaphragm *a*, doors E E, and removable plug F, and the two groups of tubes G G′, connecting the heads, and arranged in alignment, all as shown and described, for the purposes specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

WILLIAM E. HENDERSON.

Witnesses:

L. A. HODGINS,

GEO. C. ONESSIZ.