

O. BELLMAN.
Hot-Air Furnace.

No 133,293.

Patented Nov. 26, 1872.

Fig. 1.

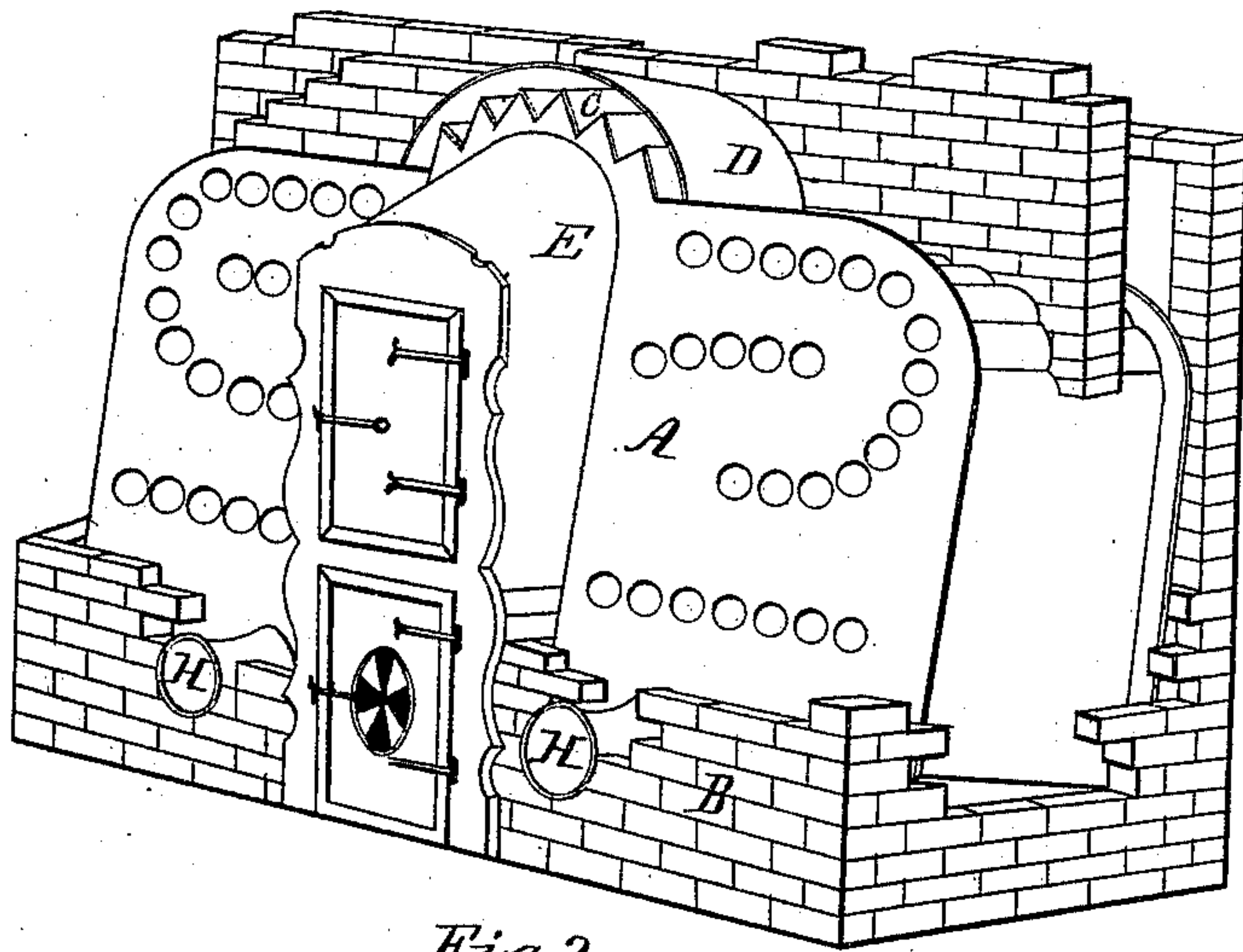


Fig. 2.

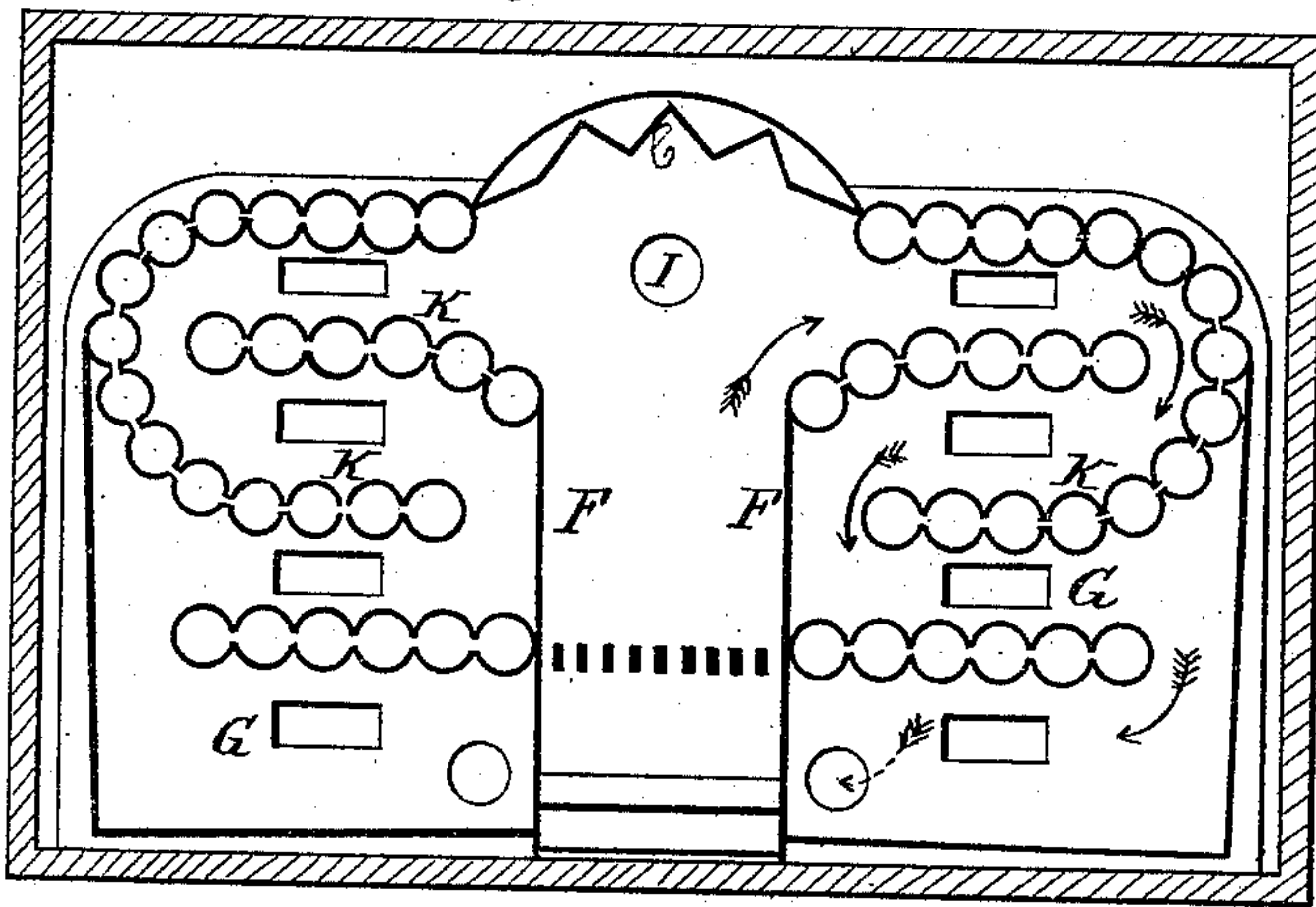


Fig. 3.

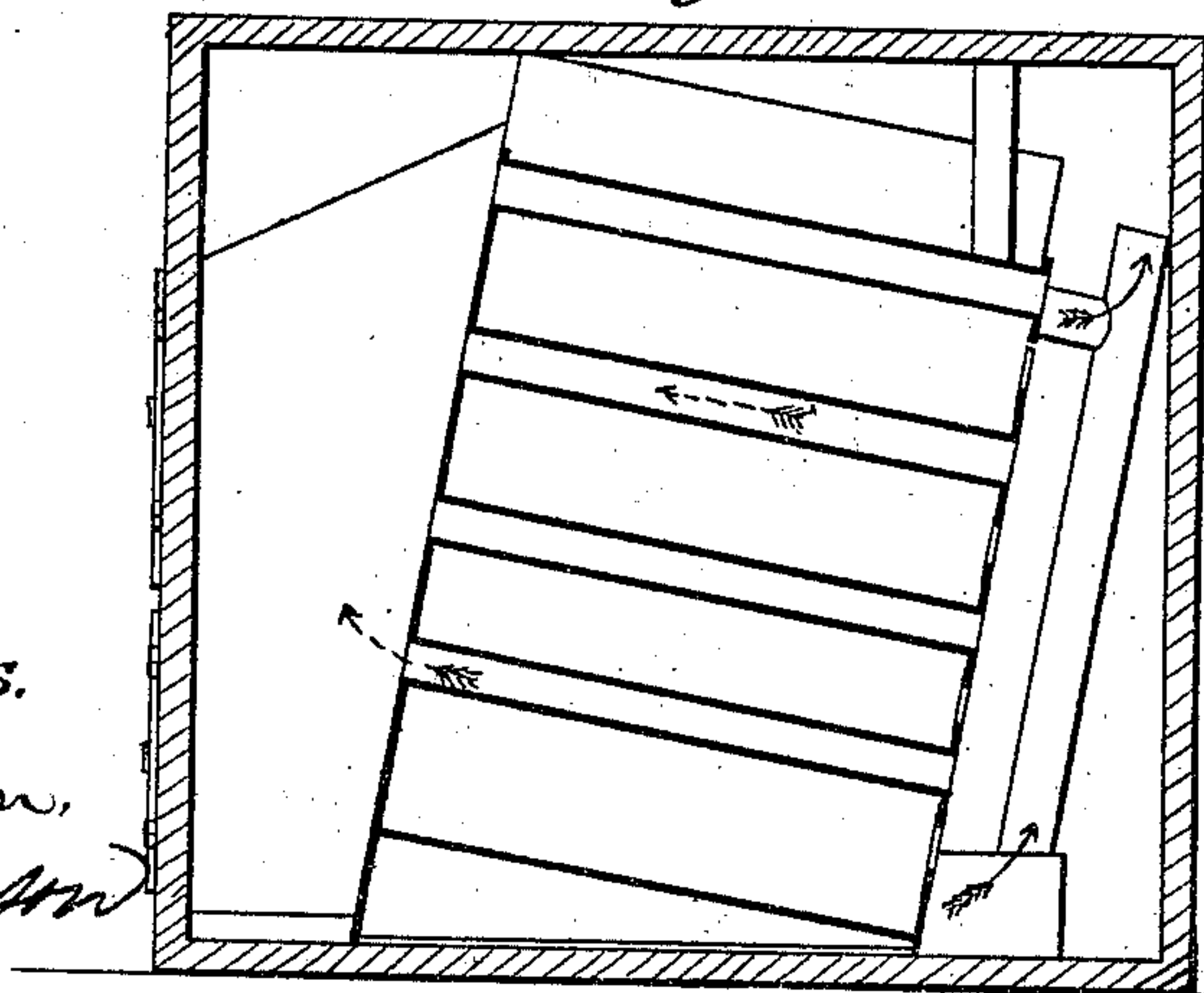


Fig. 4.



Witnesses.
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OSCAR BELLMAN, OF HAGERSTOWN, MARYLAND, ASSIGNOR TO HIMSELF
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IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. **133,293**, dated November 26, 1872; antedated November 25, 1872.

To all whom it may concern:

Be it known that I, OSCAR BELLMAN, of Hagerstown, Washington county, Maryland, have invented certain Improvements in Hot-Air Furnaces, of which the following is a specification:

In the accompanying drawing, Figure 1 is a perspective view of my improved furnace. Fig. 2 is a vertical transverse section near the back of the furnace. Fig. 3 is a central vertical section from front to rear of the furnace. Fig. 4 is a detached view, showing the manner of casting the air-pipes in sections.

My invention consists, first, in a corrugated plate above the fire-pit for the double purpose of increasing the heating-surface and preventing the plate from warping and cracking by fire; second, in a secondary arch-plate above said corrugated plate; third, in an elevated and inclined mouth-piece to the fire-pit which acts as a heating-surface, and from its position and form is not liable to warp by fire; fourth, in the use of a single iron plate without fire-brick or other lining for the sides of the fire-pit and as a radiating-surface for the hot-air chamber; fifth, in the use of a series of cleaning-holes in connection with a series of air-tubes forming a winding and descending flue; seventh, the combination of a direct draft with a series of air-tubes forming a double labyrinth or winding draft.

My invention or improvements herein described are intended to remedy certain defects which I have found in manufacturing a furnace for which a patent was granted to myself and John W. Garver in 1870, and to which reference is made for the general construction of the furnace.

In the accompanying drawing, A is the furnace proper, which is made of cast-iron, and entirely inclosed in brick-work B. The arrows made in full line represent the course of the smoke, and the dotted arrows show the direction of the air through the furnace. Above the fire-pit is a corrugated plate, C, above which is a curved arch-plate, D. The corrugated plate gives an extraordinary extent of surface for radiation on the upper side, and the arch-plate D creates a strong current up through the space between the two plates. This current very rapidly carries off the heat from plate C, and thus keeps it from getting excessively hot; and the corrugations so stiff-

en the plate that it is not liable to crack or warp like an ordinary plate or arch. The mouth-piece E of the fire-pit is arched very high from the door to the corrugated plate C, and affords a very extensive heating-surface. Also, this large mouth-plate gives a roomy chamber for diffusing the heat from the top of the fire over an extensive area of iron plate, and thus relieves, in part, the hottest parts of the fire-pit. The mouth-plate forms a double arch, which resists the warping action of the fire. The side walls F of the fire-pit I propose to use without the usual fire-brick lining, in order that these walls may better serve as heating-surfaces, and also to carry off the heat more rapidly, and thus prevent the fire from becoming too hot and scorching the air. By this plan the walls F are far less liable to burn out and the furnace will last much longer.

In the rear of the furnace I have made a series of cleaning-holes, G, so as to reach and clean all the spaces between the air-tubes, where soot and ashes are liable to collect. Also, I have made two cleaning-holes, H, in the front plate, which are very convenient and also important to the working of the furnace. At the rear of the fire-pit is a direct-draft hole, I, which will facilitate the kindling of the fire, and, therefore, is an improvement in connection with the winding flues formed by the air-tubes K. In connection with the walls F I may use a vertical series of tubes, K, thus making these walls double, and forming a hollow chamber or chambers, instead of having two tubes, K, in contact with this wall.

My series of tubes may be cast in section, and then bolted together, as shown at L in Fig. 4, which is a great improvement over separate tubes, which require more labor.

Having described my invention, I claim—

1. The above-described arrangement and combination of the corrugated plate C, the secondary plate D, and the inclined and arched mouth-plate E, in relation to the fire-pit F, substantially as set forth.

2. I also claim the combination of the three series of hot-air tubes K with the cleaning-holes G and direct-draft hole I, substantially as set forth.

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