

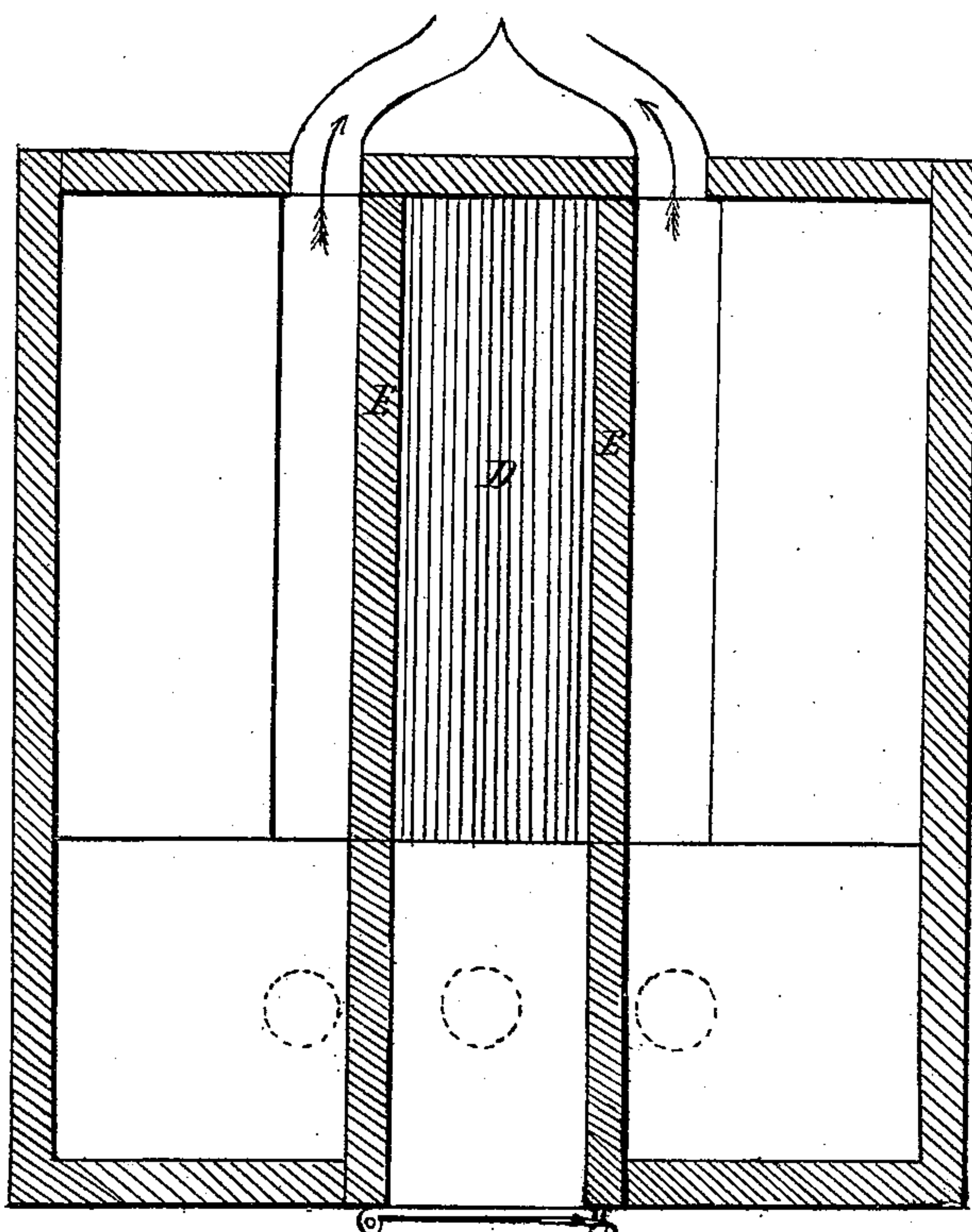
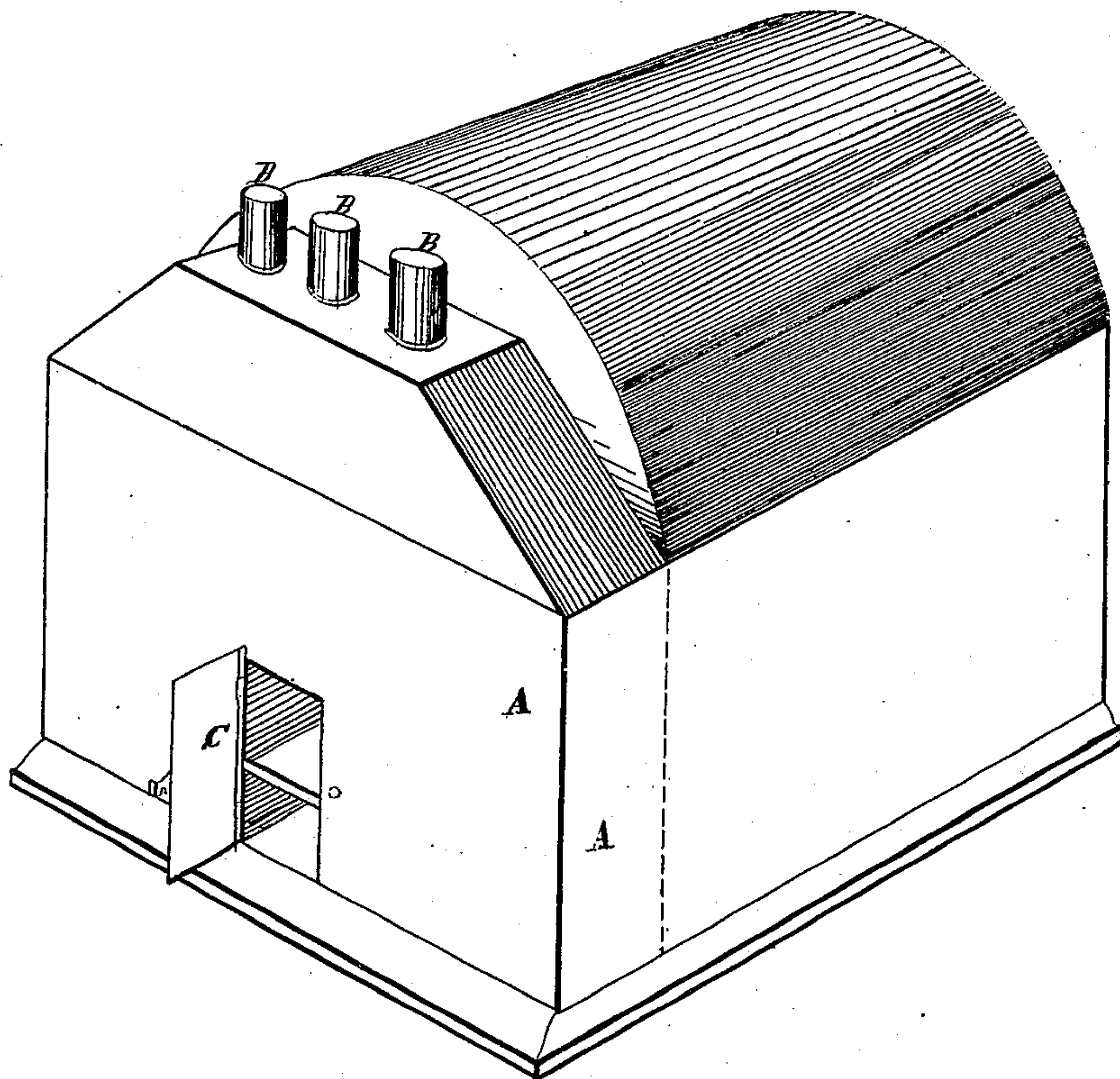
O. BELLMAN & J. W. GARVER.

2 Sheets—Sheet 1.

Hot Air Furnace.

No. 100,107.

Patented Feb'y 22, 1870.



Inventor. O. Bellman
& John W. Garver
Daniel Breed, Atty.
Witnesses
Oym H. Seaman
Chas. E. Wilson

O. BELLMAN & J. W. GARVER.

2 Sheets—Sheet 2.

Hot Air Furnace.

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Fig 3

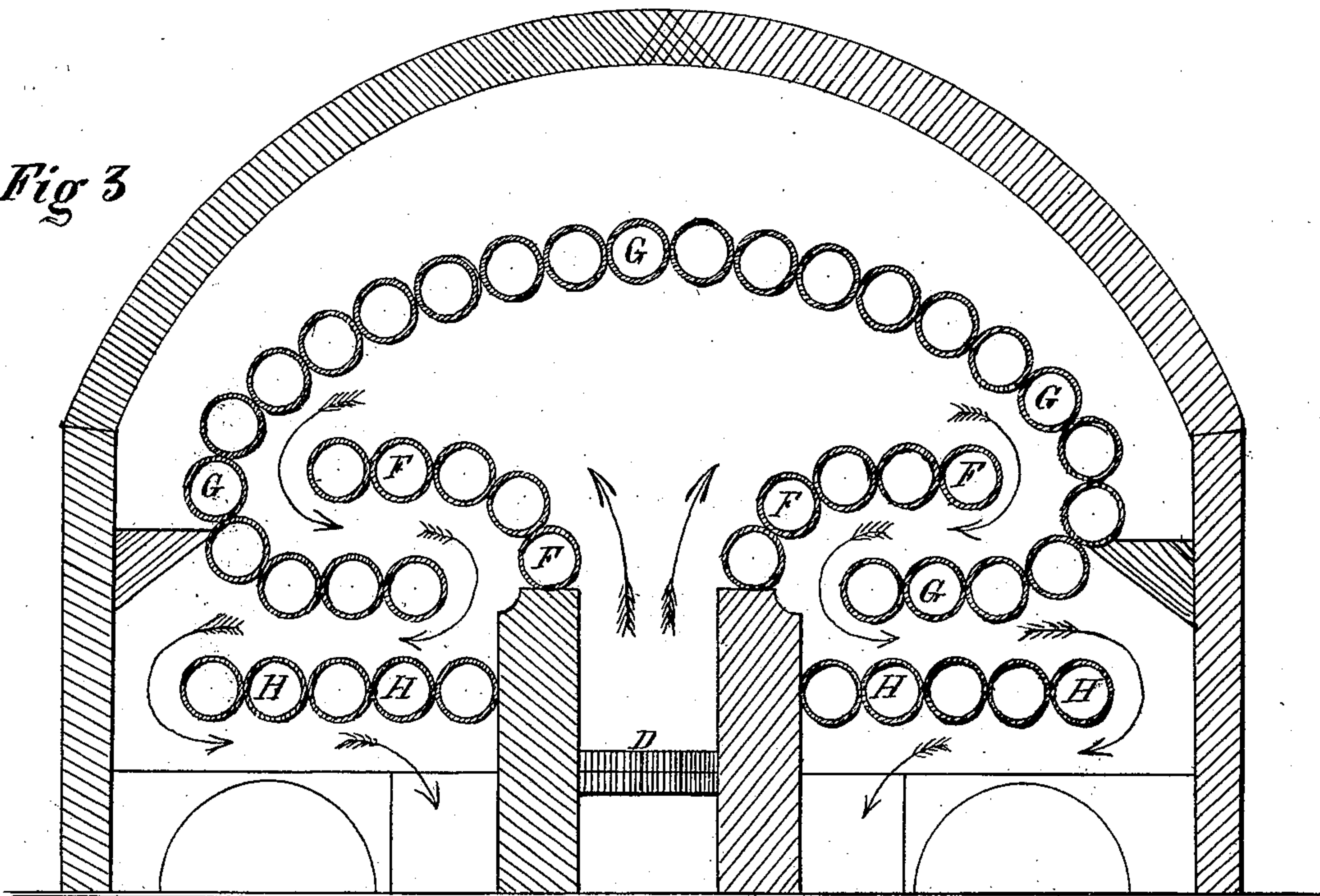
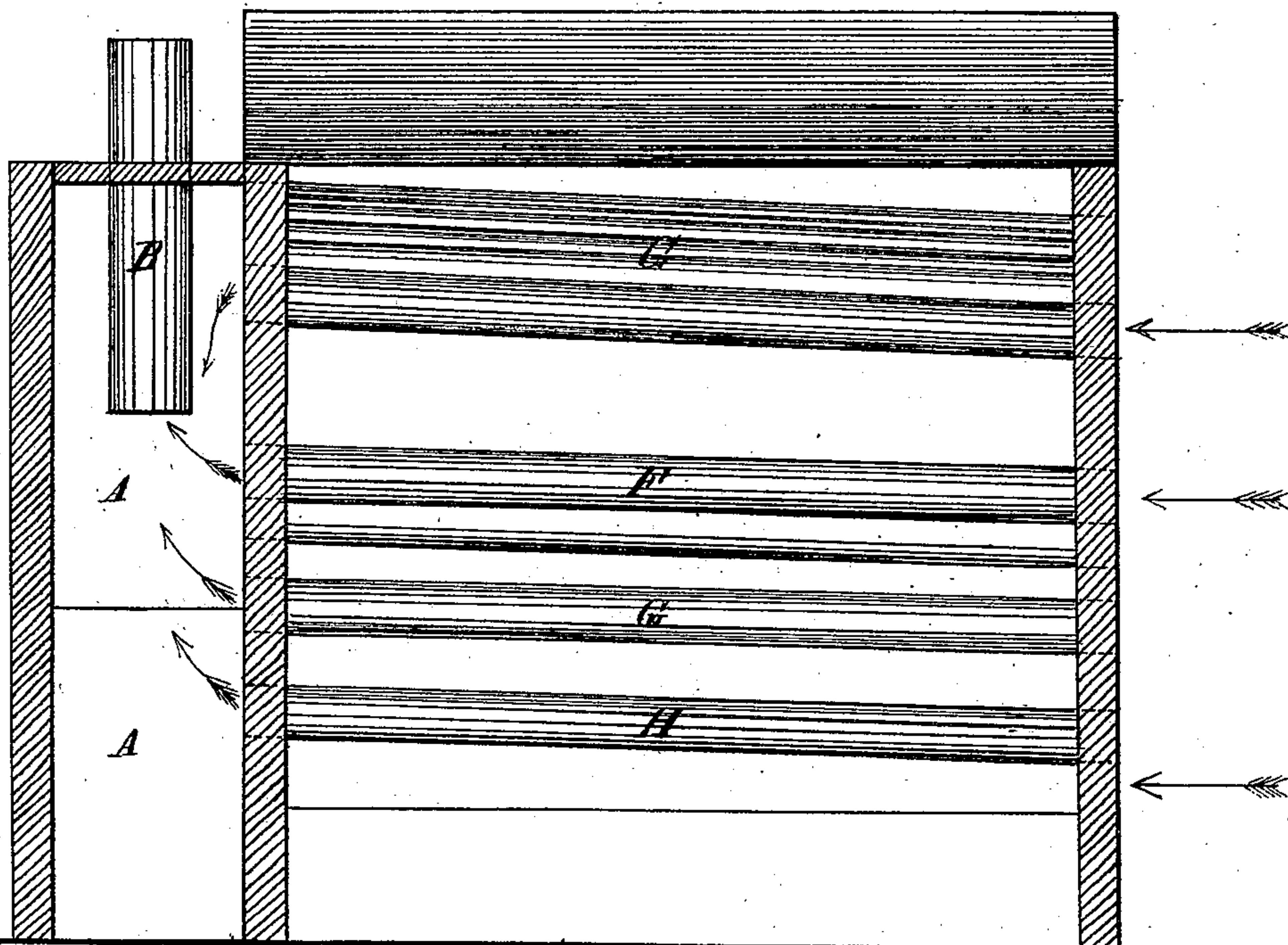
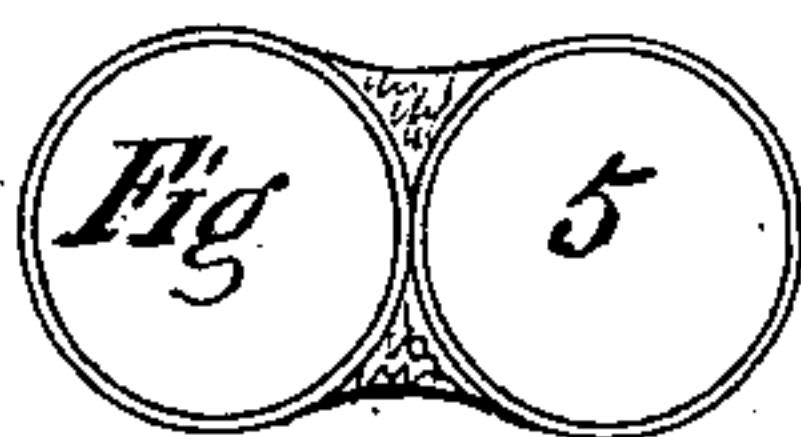


Fig 4



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United States Patent Office.

OSCAR BELLMAN AND JOHN W. GARVER, OF HAGERSTOWN, MARYLAND.

Letters Patent No. 100,107, dated February 22, 1870.

HOT-AIR FURNACE.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that we, OSCAR BELLMAN and JOHN W. GARVER, of Hagerstown, in the county of Washington, and State of Maryland, have invented a new and useful Improvement in Furnaces for Heating Dwellings and other Buildings; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

In the accompanying drawings—

Figure 1 is a perspective view of our improved furnace.

Figure 2 is a plan of the same.

Figure 3, sheet 2, is a transverse section.

Figure 4, sheet 2, is a longitudinal section.

Figure 5 is a detached view, showing two tubes, with mortar closing the space between them.

Our invention consists of a peculiar novel construction and arrangement of furnace for heating dwelling-houses and other buildings.

In the construction of our improved furnace, we make the walls of the same of brick work, and insert therein several series of air tubes, which not only serve for passage of heated air, but also they form partitions which serve as the sides of the flues, as will be hereafter fully described.

Our furnace may be made in the form shown in fig. 1, the chamber for heated air being in front at A, with the tubes B for conducting the heated air to the room or rooms to be heated.

The fuel is introduced at C.

The fire-chamber is situated at D, fig. 2, and upon the walls E of this fire-chamber rest a series of air-tubes, F, fig. 3, sheet 2.

Above the fire-chamber is an arched series of air-tubes, G, with their ends resting in the walls of the furnace. This arched series is curved downward and then inward nearly to the walls of the fire-chamber.

A third series of air-tubes, H, is placed below the two series above described.

All these series of tubes form the sides of the flues, and the spaces between the tubes must be closed airtight by mortar made of fire-clay or other suitable material, as shown in fig. 5.

The smoke from the fire takes the course indicated

by arrows, and escapes in two currents near the bottom of the furnace, when the two currents unite and enter the chimney.

The pure air enters the air-tubes in the rear of the furnace, as indicated by arrows in fig. 4, sheet 2, and passes directly through the furnace to the air-chamber A.

All the air-tubes are set obliquely, the ends near the air-chamber being elevated more or less, in order to set the current of air always inward toward the air-chamber. The degree of elevation is varied according to circumstances. We generally prefer to set the tubes from one to fifty-five degrees inclination from a horizontal line.

The pipes in our furnace may be made in part of cast-iron and in part of sheet iron, the tubes, which are exposed to great heat and liable to burn, being better when made of cast-iron.

The position of the series of pipes may be somewhat varied without departing from our invention, though we prefer the above-described arrangement. By placing the main upper series in an arch, the central and upper tubes are far enough from the fire not to be burned, and the sides of the arch are not too far from the fire. By our arrangement of the series of tubes both sides of the flues are formed of series of tubes, thus rapidly imparting heat to the air within the tubes.

A furnace may be made similar to ours with walls of cast-iron, but we prefer masonry.

Having described our invention,

We claim—

1. The arrangement of a series of air-tubes, F, above the fire-chamber, in combination with the hot-air chamber A, when placed in front of fire-chamber, substantially as set forth.

2. An arched series of tubes, G, above the fire, substantially as set forth.

3. A smoke-flue, when both sides of the same within the furnace are made entirely or chiefly of series of air-tubes, substantially as set forth.

OSCAR BELLMAN.
JOHN W. GARVER.

Witnesses:

SAML. F. ZIEGLER,
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