

C. CLARK.
HOT-AIR FURNACE.

No. 171,351.

Patented Dec. 21, 1875.

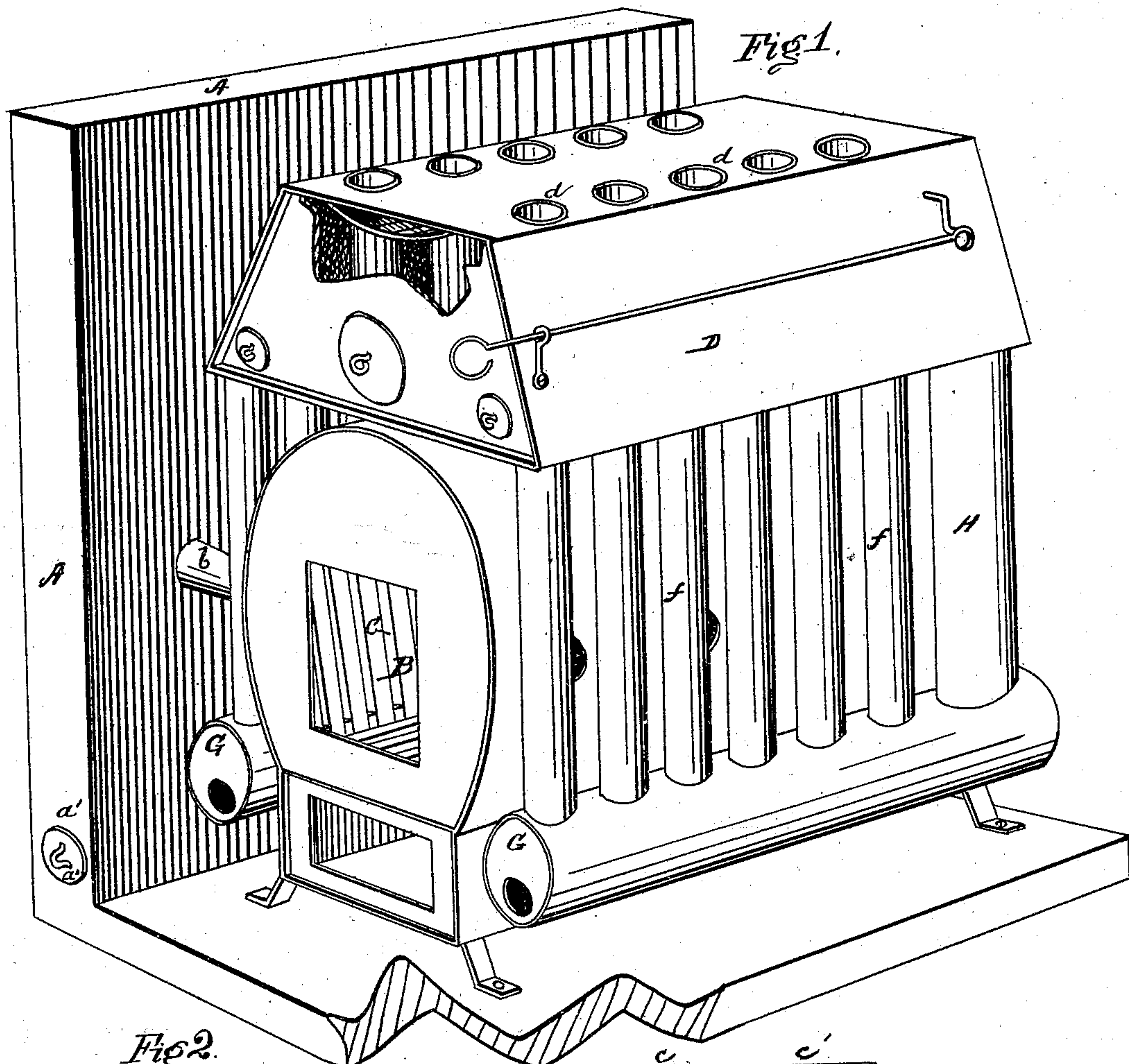
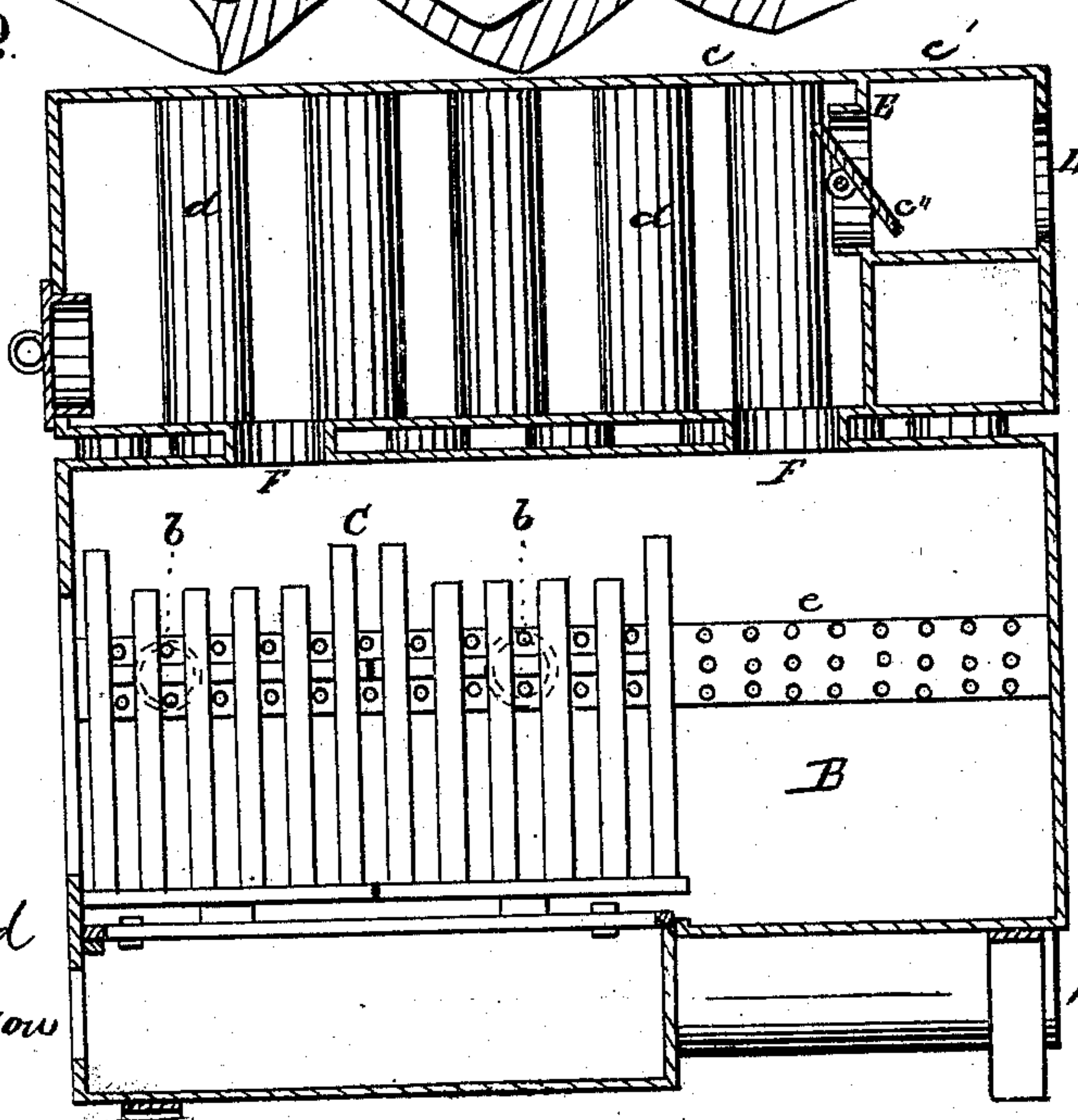


Fig 2.



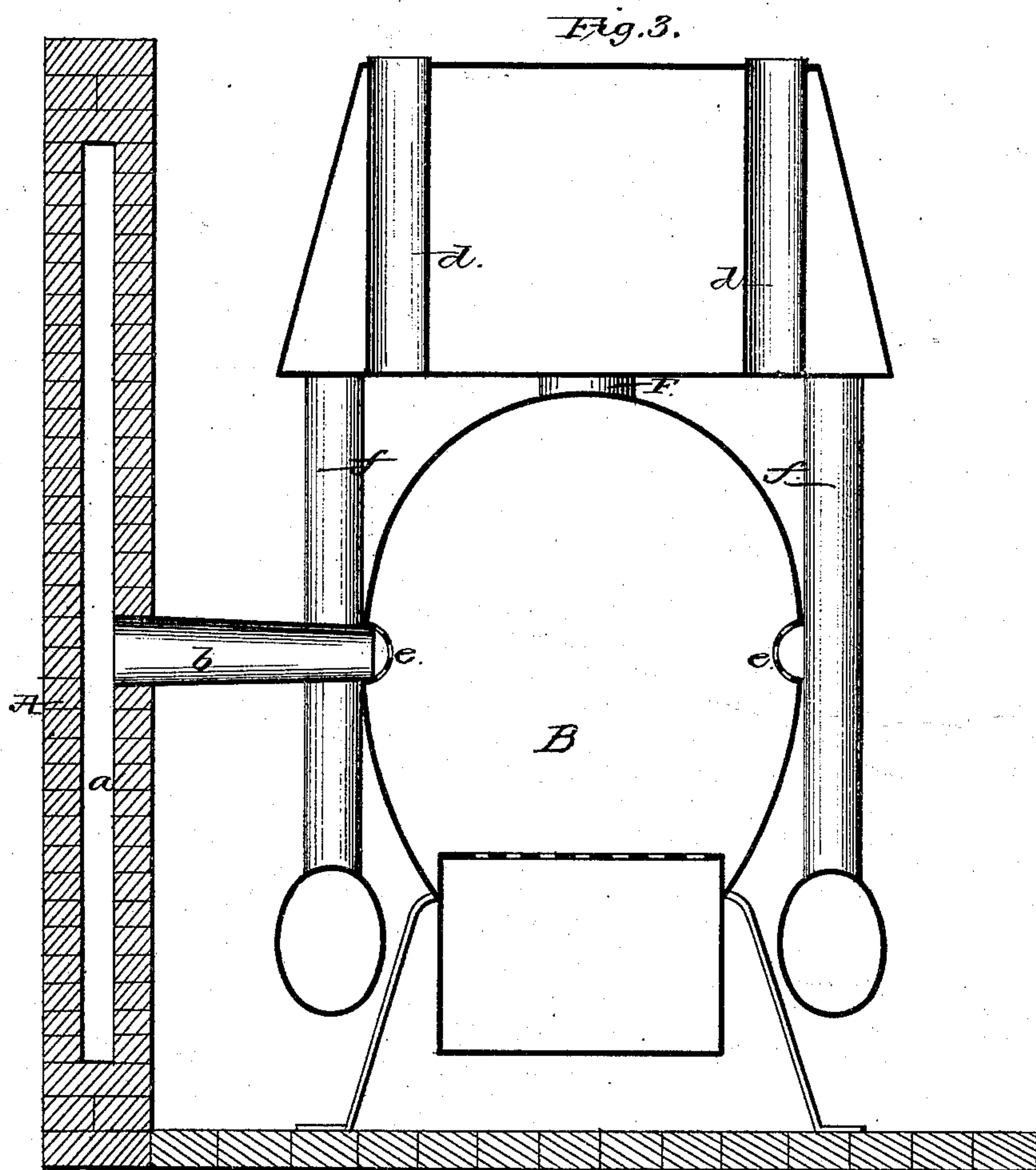
Witnesses:
L. B. Townsend
Will H. Maxon

Inventor:
Chas. Clark
per Atty.
A. H. Evans & Co.

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UNITED STATES PATENT OFFICE.

CHARLES CLARK, OF MINNEAPOLIS, MINNESOTA.

IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. **171,351**, dated December 21, 1875; application filed October 22, 1875.

To all whom it may concern:

Be it known that I, CHARLES CLARK, of Minneapolis, Minnesota, have invented a new and useful Improvement in Hot-Air Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a perspective view of a hot-air furnace with only one side of the brick wall, and with my improvements attached. Fig. 2 is a longitudinal section. Fig. 3 is a cross-section through *xx*. Fig. 4 is a cross-section through *yy*.

My invention relates to that class of furnaces designed for heating air to warm dwellings and other buildings, and is an improvement on Patent No. 153,537, issued to me on the 28th day of July, 1874. It consists in the combination of devices hereinafter described and explained.

To enable others skilled in the art to make and use my invention, I will proceed to describe the exact manner in which I have carried it out.

In the drawings, A represents the outside wall of a furnace, constructed with internal air-chambers *a*, communicating with the outside air by means of the pipes *a'*, provided with registers *a''*. The air-chamber *a* also communicates with the fire-box B through the pipes *b b*. The shell of the fire-box is made in the usual manner, and is provided with a removable grate-lining, C, conveniently made in sections, that it may be readily replaced or changed. Extending longitudinally along the side of the fire-box are secured the semi-cylindrical perforated air-chambers *e e*, the perforations in each being at points opposite to the spaces between the bars of the grate-lining C, so as to admit the jets of air directly to the fire, between the grates of the lining. These air-chambers being semi-cylindrical on their inner side, the jets of air pass radially to the fire, and necessarily strike it at every point, and the air-chambers being placed on a line near or above the center of the fire not only tends to preserve both the

grating and the shell from the injurious effects of heat, but, supplying fresh oxygen at every point of the fire-box, causes a more complete combustion of the gases and particles of fuel, which would otherwise pass off with smoke, thus effecting a great saving in utilizing what would otherwise be lost.

Through the sides of the radiator D, located above the fire-box B, I construct a series of vertical air-flues, *d d*, by which I secure a vigorous circulation of the air, and bring it in more rapid contact with the fire. In the radiator is the diaphragm E, which separates the radiator into divisions *c c'*. Flues F F allow the smoke to pass from the fire-box to division *c* of the radiator, whence it passes through an opening in the diaphragm into division *c'*, and escapes through the chimney L. In the diaphragm is placed a damper, *c''*, operated by any convenient means, which, when closed, causes the smoke to descend through the series of flues *ff* to the horizontal drums G, whence it passes off through the tubes H H to the division *c'* of the radiator D, and thence through the chimney L.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a hot-air furnace, the fire-box B, provided with the horizontal semi-cylindrical perforated air-chambers *e e*, in combination with the grate-lining C and air-pipes *b b*, substantially as and for the purpose set forth.

2. The fire-box B, provided with the semi-cylindrical perforated air-chambers *e e*, grate-lining C, and air-pipes *b b*, in combination with the radiator D, provided with vertical flues *d d*, the diaphragm E, provided with the damper *c''*, and the flues *f f*, horizontal drums G, and tubes H H, all constructed to operate substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand.

CHARLES CLARK.

Witnesses:

H. R. BURCH,
VERNON BELL.