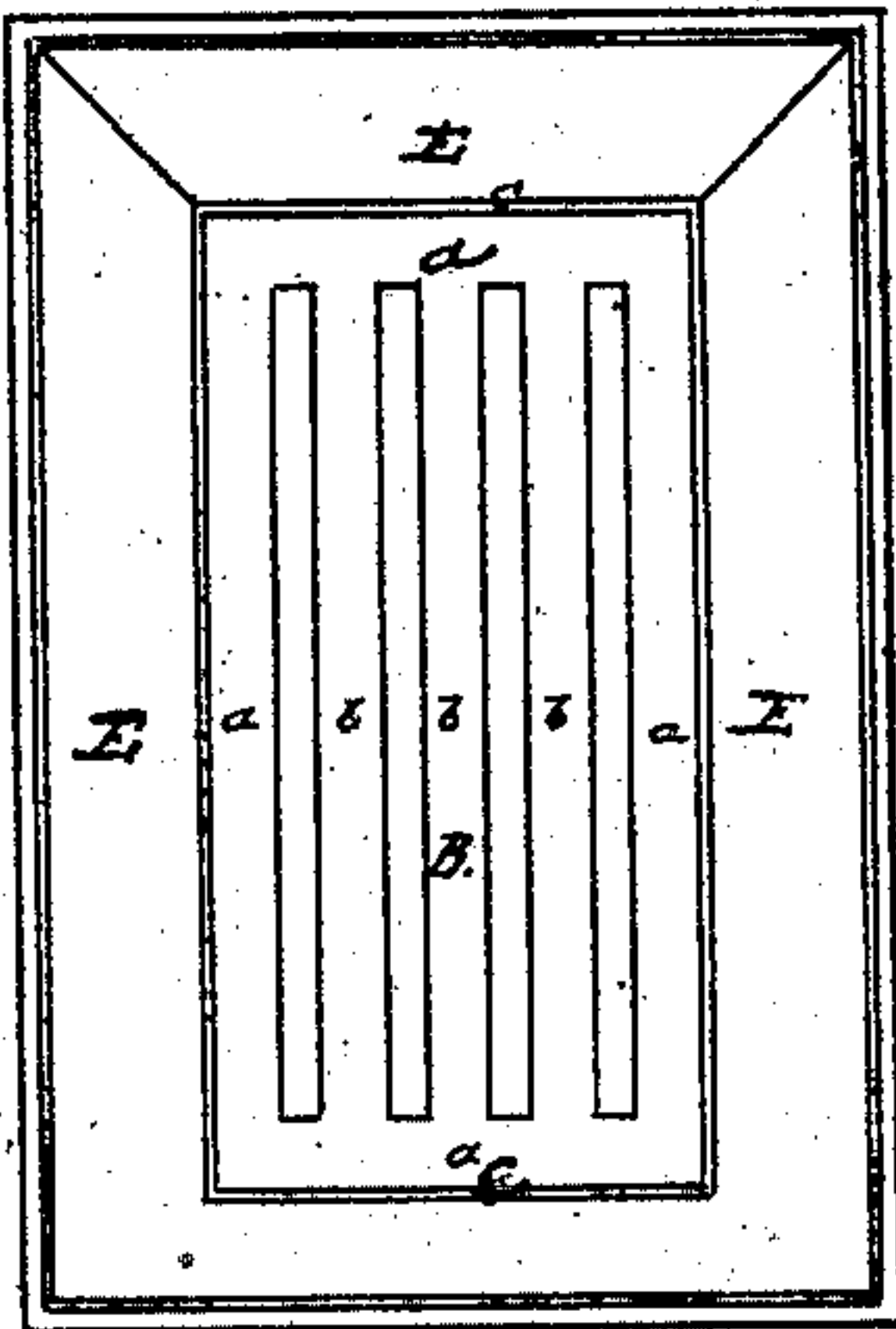


M. I. Horton.
Furnace.

Nº 74536
Fig. 1.



Patented Feb, 18, 1868.
Fig. 6.

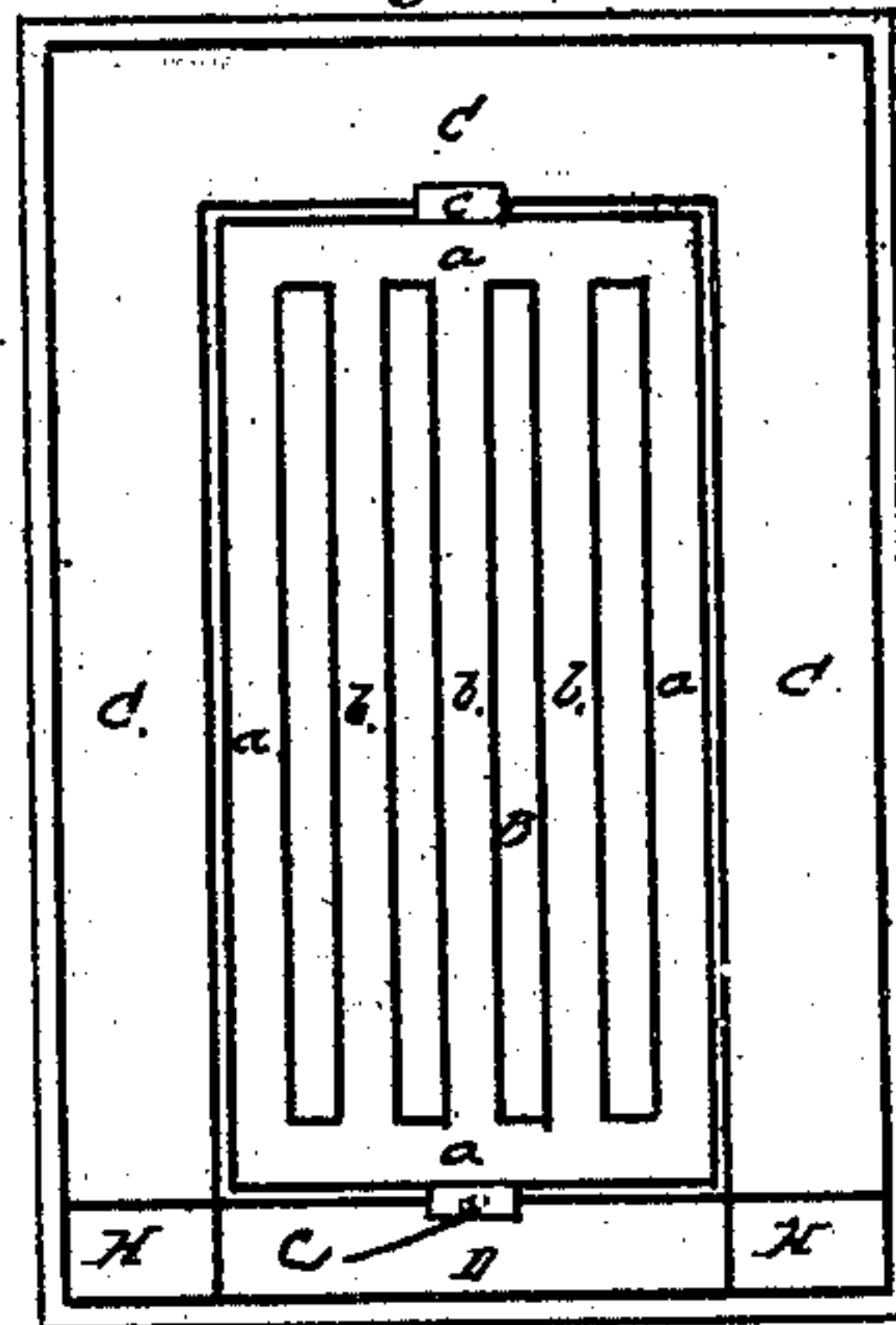


Fig. 3.

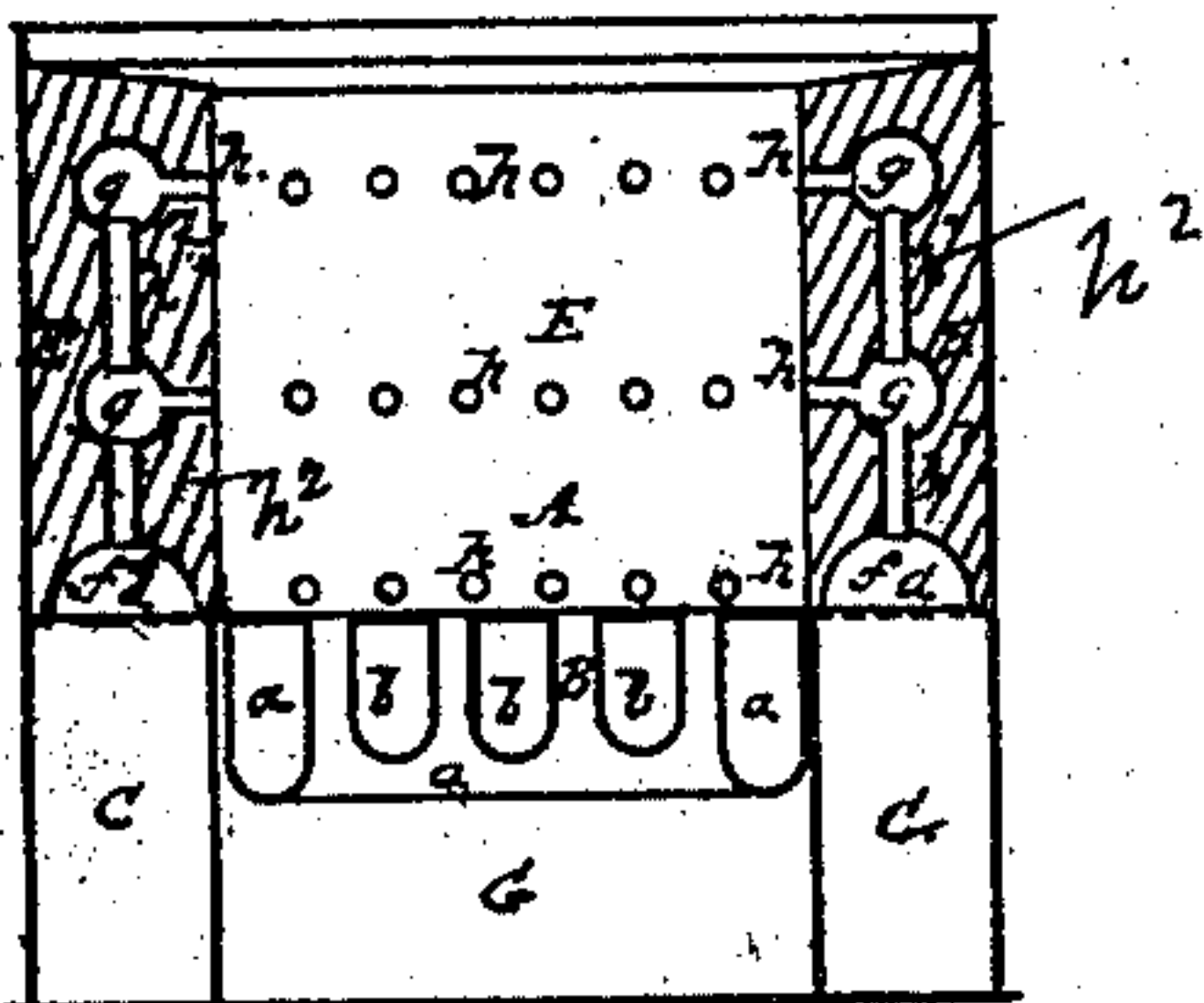


Fig. 2.

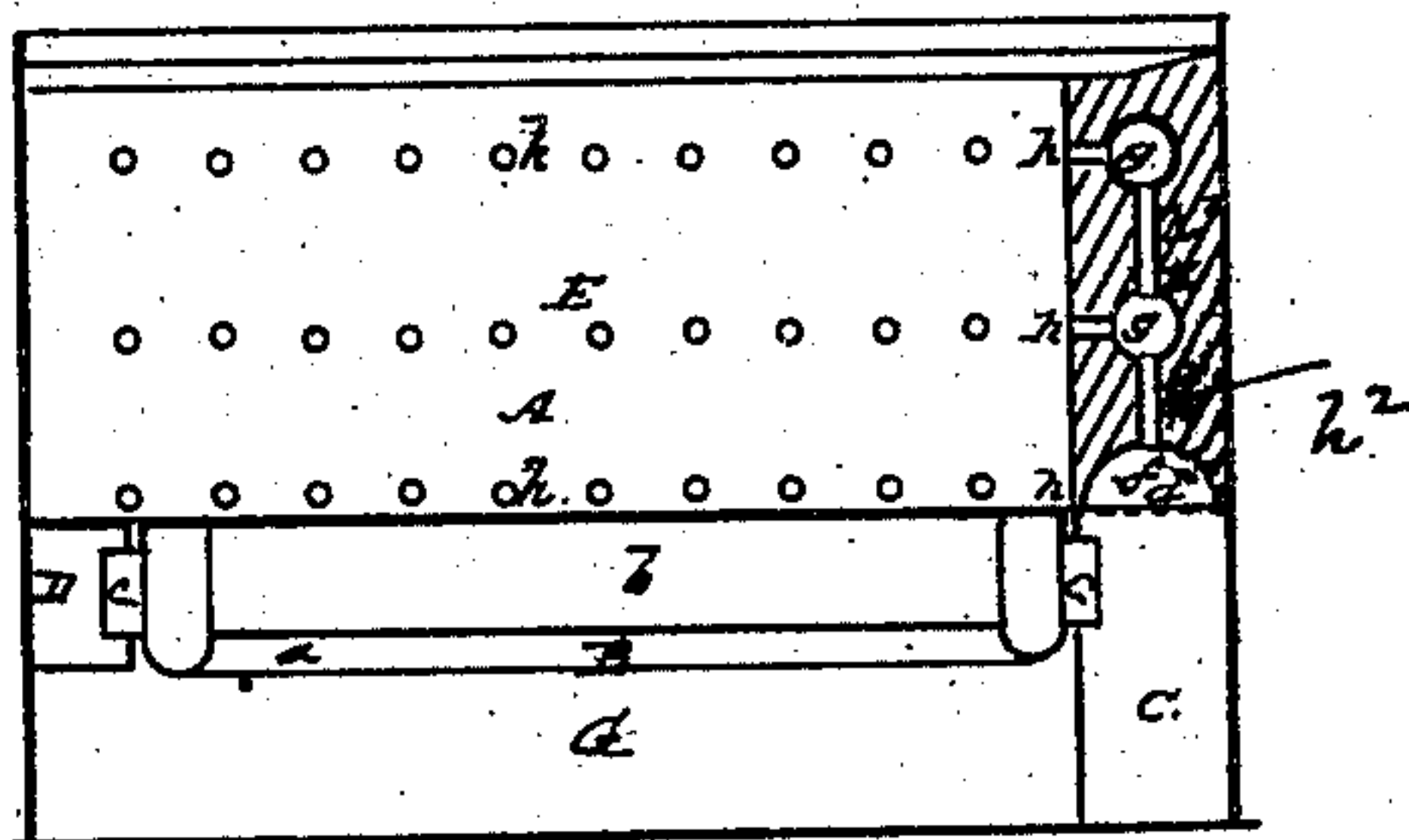


Fig. 4.

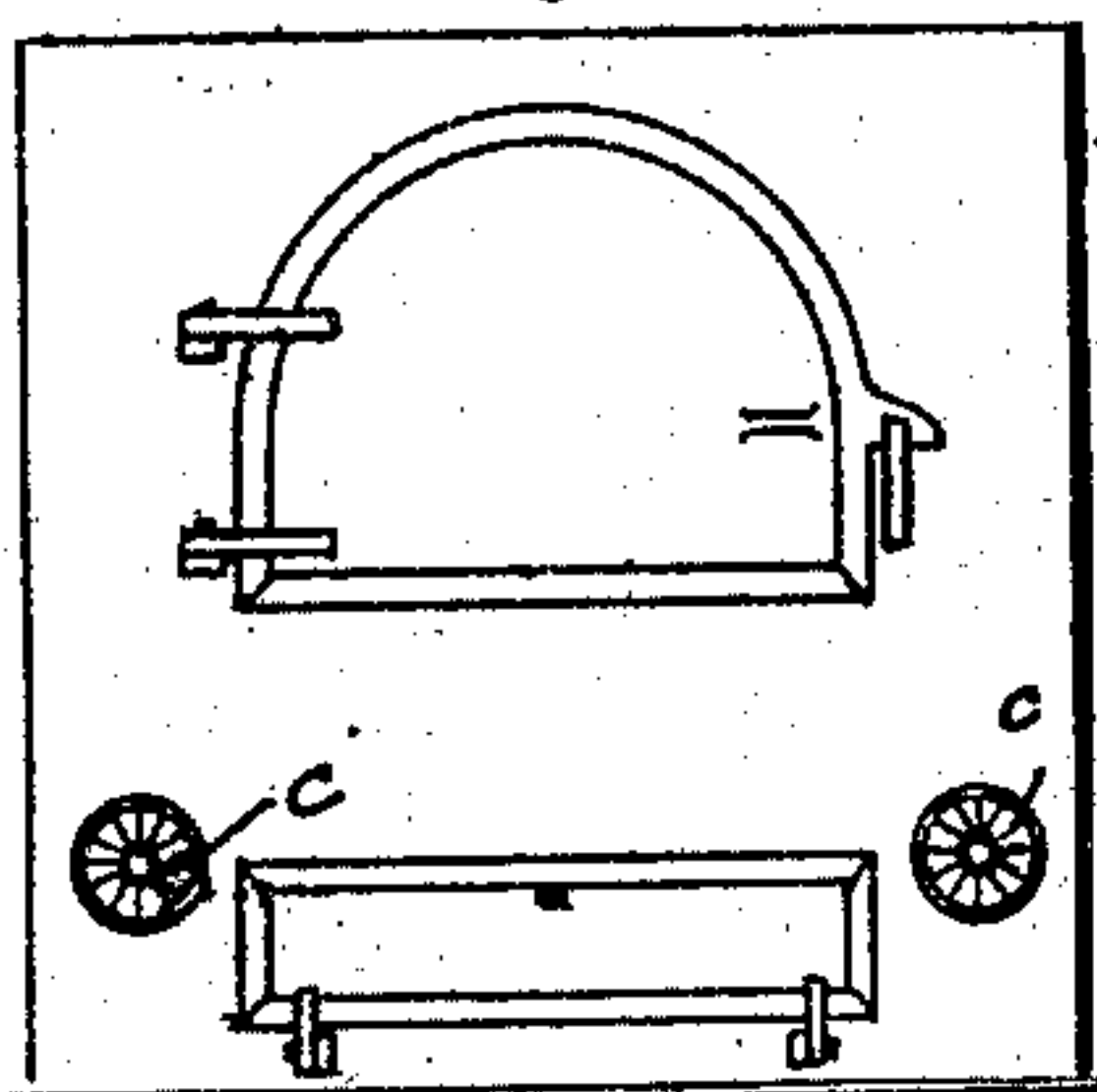
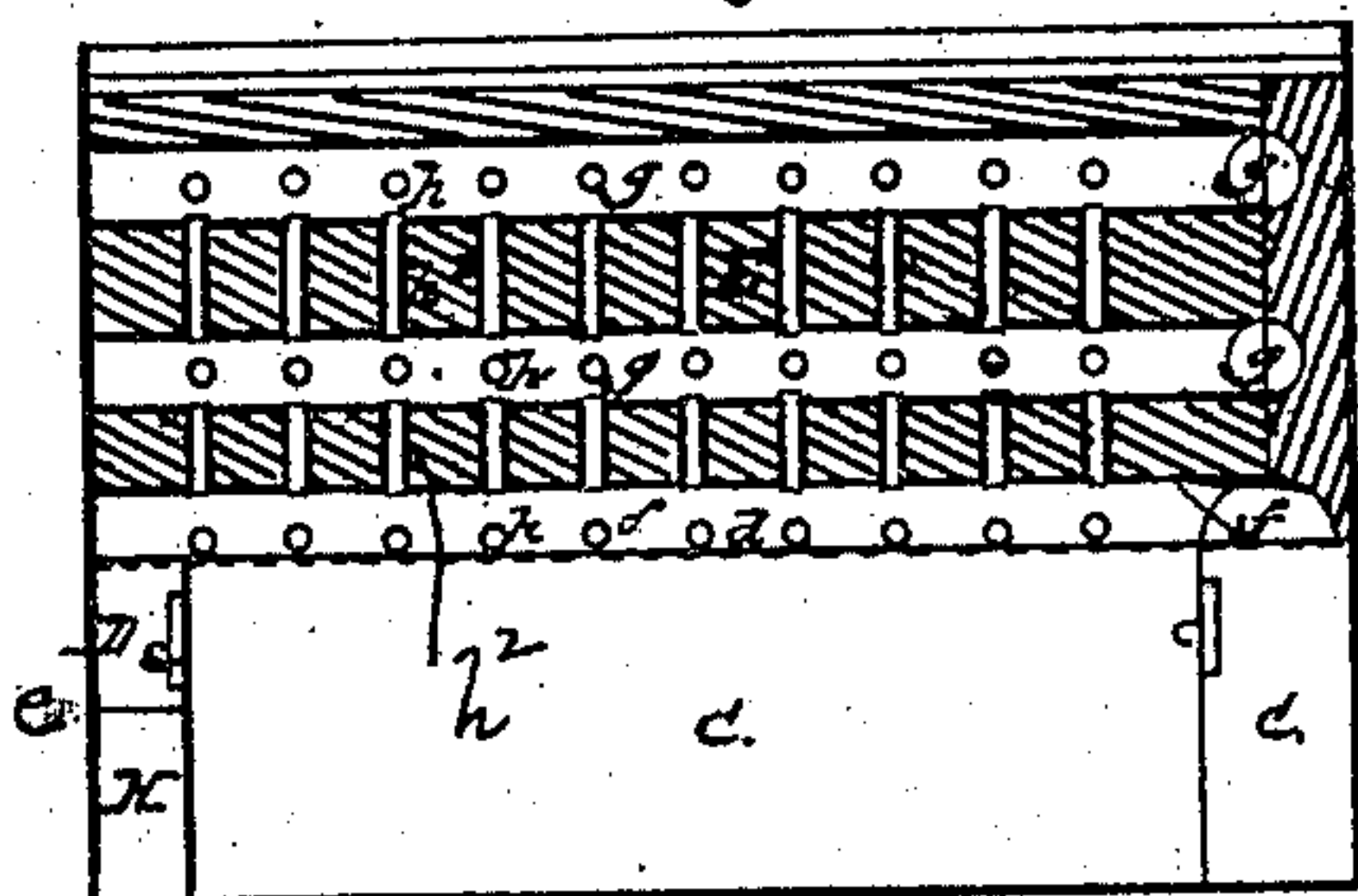


Fig. 5.



Witnesses;
J. N. Piper.
J. W. Snow.

M. I. Horton.
by his Attorney
R. B. Eddy

United States Patent Office.

MARCUS L. HORTON, OF WORCESTER, MASSACHUSETTS.

Letters Patent No. 74,536, dated February 18, 1868.

IMPROVEMENT IN FURNACES.

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

TO ALL PERSONS TO WHOM THESE PRESENTS MAY COME:

Be it known that I, MARCUS L. HORTON, of the city and county of Worcester, and State of Massachusetts, have invented a new and useful Improvement in Furnaces for the combustion of fuel; and I do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 is a top view,

Figure 2 a longitudinal and vertical section,

Figure 3 a transverse section, and

Figure 4 a front elevation of the said furnace.

Figure 5 is a longitudinal and vertical section, taken through the fire-proof lining of one side of the chamber of combustion:

Figure 6 is a horizontal section, taken through the grate and the lateral air-chambers.

In such drawings A is the fireplace or chamber of combustion, provided with a rotary grate, B, whose frame *a*, bars *b b*, &c., and journals *c c*, are hollow or tubular, so as to allow air to pass into one journal, thence through the frame and the several bars, and thence through the other journal. Surrounding the ash-chamber G and the grate, on their sides and rear ends, is an air-conduit or chamber, C, into which the rear journal of the grate opens. This air-chamber has a perforated or foraminous top, *d*. In front of the grate is another air-chamber, D, into which the other or front journal of the grate opens. The said air-chamber D receives its air from two vertical conduits, H H, arranged at its ends, and provided with inlets, which are shown at *e e* in fig. 4. Over and resting upon the foraminous cap *d* of the chamber C is a fire-brick or fire-proof lining, E, which is arched or channelled, as shown at *f*, directly over the foraminous top. Within the fire-proof lining is a series of horizontal pipes, *g g g*, which extend throughout the lining, and have numerous holes, *h h h*, leading out of them and into the chamber of combustion. Furthermore, these several pipes and the channel *f* are connected by short vertical pipes, *h² h² h²*, in order that the air, as heated, may flow upward into and circulate through the pipes of the fire-proof lining, and be heated by caloric abstracted from their inner surfaces. There should be doors to the fireplace and ash-chamber mouths, and also dampers, registers, or doors to the air-inlets, and there may also be a damper in the discharge-flue of the furnace.

From the above it will be seen that, when there is fuel in a state of combustion in the fireplace, air will flow into the inlets *e e*, thence into the conduits H H, thence into the chamber D, thence through the grate, thence into and through the chamber C and out of the holes of its top, thence into and through the several pipes of the fire-proof or fire-brick lining, and thence out of their orifices of discharge and into the chamber of combustion, and the fuel and gases that may be therein: The air thus introduced into the fuel, and for the promotion and support of combustion thereof, will, during its passage through the grate and passage of the fire-proof lining, be very much heated, and will thereby facilitate the combustion of the fuel and gases.

The system of metallic pipes arranged in the fire-proof lining serves to give strength thereto, and to reduce its temperature and keep it intact under the action of the fire.

What I claim as my invention, in the above-described improved furnace, is as follows:

I claim the combination as well as the arrangement of the air-chambers D C, and the grate made hollow, and with hollow journals to open into such chambers respectively, as set forth.

I also claim the arrangement of horizontal and vertical pipes or conduits of the fire-proof lining of the fireplace, such pipes being arranged within such lining, and made to communicate with each other and the fireplace, and with the external atmosphere, so that air may flow into and through the pipes and lining, and be discharged into the fireplace, as specified.

I also claim the combination of the system of pipes and air-passages in the fire-proof lining with the air-chamber C, partially surrounding the ash-chamber and grate, and made with a perforated top, as set forth.

I also claim the arrangement of the hollow grate and its hollow journals, the induction and eduction-air chambers D C, the fire-proof lining, and a system of pipes or air-conduits arranged in such lining, and made to communicate with the chamber C and the fireplace, substantially as specified.

MARCUS L. HORTON.

Witnesses:

THEODORE S. JOHNSON,
F. T. BLACKMER.