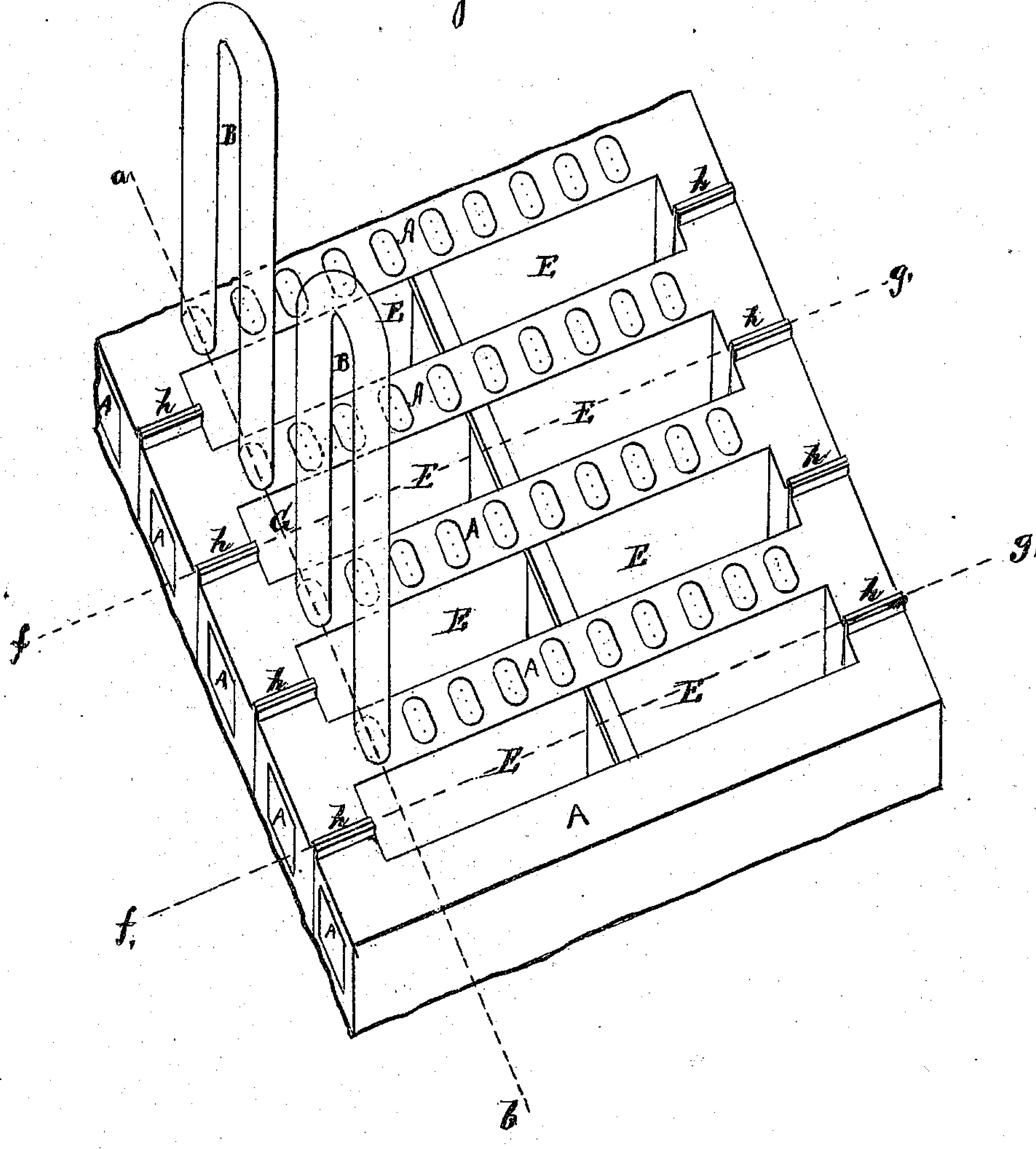
J. M. HARTMAN.

OVEN OR STOVE FOR HEATING THE BLAST OF BLAST FURNACES.

No. 105,678. Patented July 26, 1870.

Fig. 1.



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3 Sheets—Sheet 2.

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Fig 2.

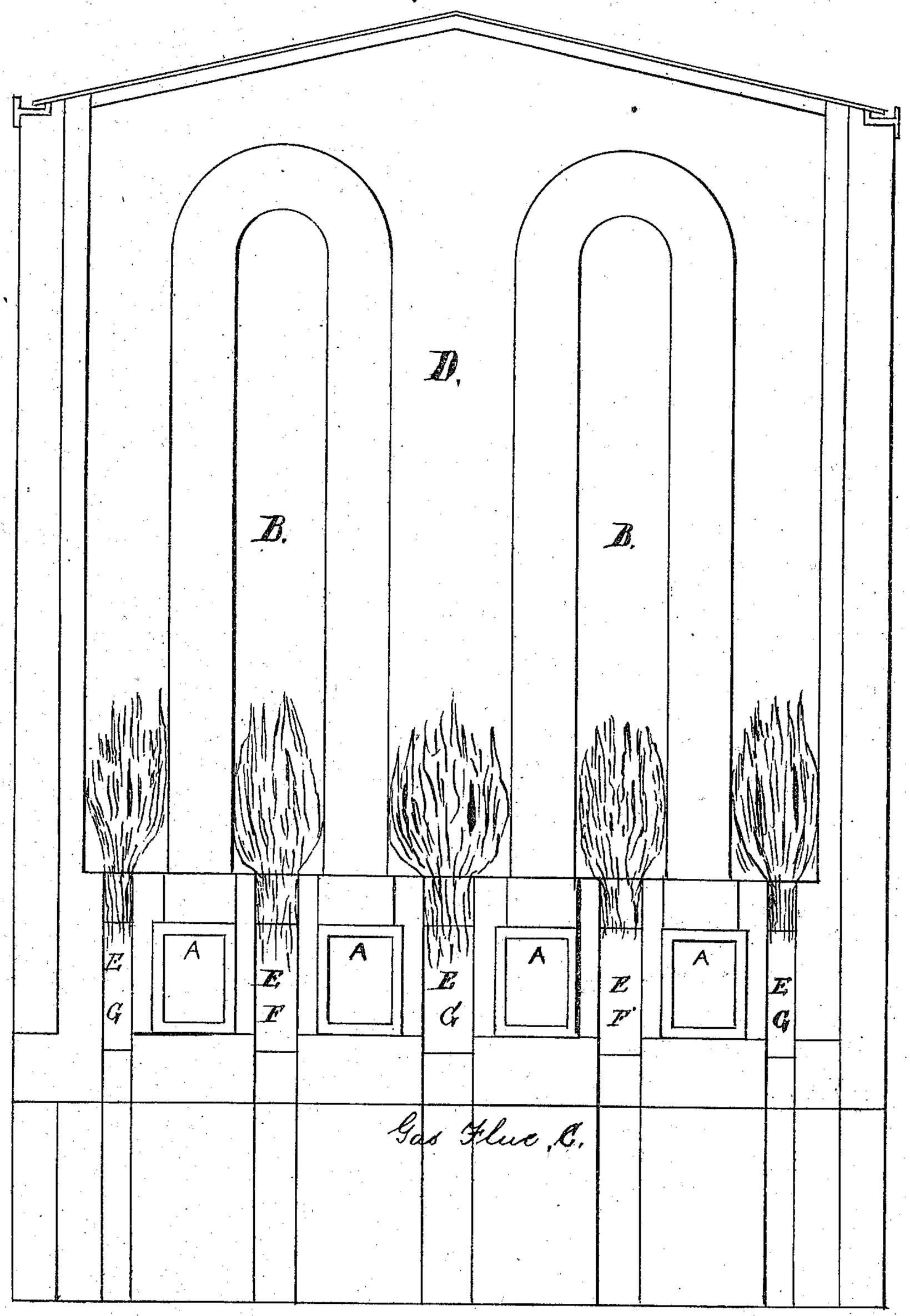

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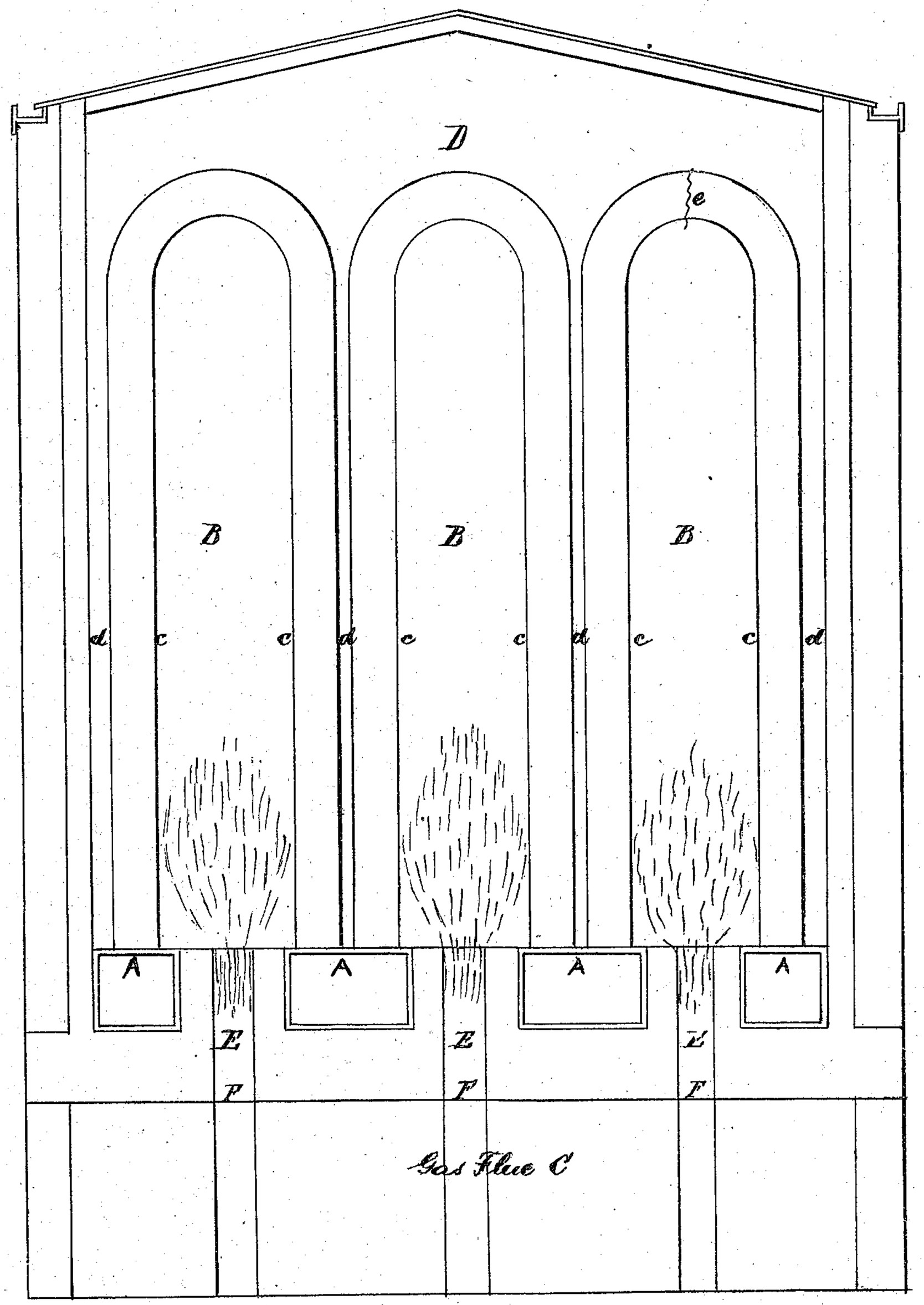
Fig. 3.



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JOHN M. HARTMAN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO GEORGE W. WHITAKER.

Letters Patent No. 105,678, *dated July* 26, 1870.

IMPROVEMENT IN OVENS OR STOVES FOR HEATING THE BLAST OF BLAST-FURNACES.

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

To all whom it may concern:

Be it known that I, JOHN M. HARTMAN, of the city and county of Philadelphia and State of Pennsylvania, have invented Improvements in Ovens or Stoves for Heating the Blast of Blast-Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

My invention consists—

First, in dividing the flame which heats the siphons of a blast-heating stove or oven of blast-furnaces, that it may impinge on the outer as well as on the inner surface or edge of each leg, and thereby heat the metal of the same uniformly, and prevent it from cracking by unequal expansion, and also from burning on the inner surface or edge.

Second, in dividing or separating the adjacent legs of contiguous transverse siphons by gas-openings.

On reference to the accompanying drawing and to the letters of reference marked thereon, making part of this specification—

Figure 1 is a perspective view of the bed-pipes and siphons of a blast-heating stove or oven, showing my invention;

Figure 2 is a sectional end view of a blast-heating stove or oven with my improvements; and

Figure 3 is a sectional end view of a blast-heating stove or oven, being the construction of almost all the old furnaces now in use.

Similar letters refer to similar parts in the several views.

A are the bed-pipes of a blast-heating stove or oven, and

B the siphons, the legs of which are placed transversely to the bed-pipes, in the direction of the line *a b*, fig. 1, and securely cemented in sockets.

The blast enters one of the ends of the bed-pipes and ascends and descends the siphons, thus insuring the passage of the air over all the surface of the stove.

Heretofore, as shown in fig. 3, the gas from the gas-flue C was admitted to the heating-chamber D through the gas-openings E, between the legs of each longitudinal row of siphons. The consequence was, that the inner surface or edge *c* of the legs of each siphon, where the heat played, was heated much greater than the outer edge *d*, where the heat did not impinge; consequently, the expansion being unequal, the legs were cracked and rendered useless. For the same reason the inner edge or surface was burned out, leaving the outer edge perfectly sound. The brick-work was also expanded by the heat, and forced the bed-pipes apart, which cracked the siphon at its turn, as shown at *e*.

My invention divides the bed-pipes A longitudinally, as shown by the dotted line *f g*, fig. 1, by means of gas-openings E, not only between the legs of the same siphon, as by the old method, shown at F, figs. 2 and 3 of the accompanying drawing, but it also divides the adjacent legs of the contiguous transverse siphons, (on the transverse lines *a b*, fig. 1,) as shows at G, figs. 1 and 2, whereby the surface of each siphon-leg is entirely exposed to the gas from the gas-openings E, and the heat is more uniformly and evenly distributed.

By distributing the heat around the legs of the siphon, its entire surface expands and contracts equally, thereby preventing it from spreading and cracking at its point of contact with the flame.

When flanges *h*, fig. 1, are cast on the branches at the ends of the bed-pipes, and bolted or locked together, the bed-pipes are prevented from spreading by the expansion of the brick walls.

My improvements are only applicable to bed-pipes where the blast passes transversely from bed-pipe to bed-pipe through the siphons.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. Dividing the flame or gas of a blast-heating stove or oven, substantially for the purpose shown and described.

2. Dividing the adjacent legs of contiguous transverse siphons by gas-openings, as shown and described.

In testimony whereof I hereunto sign my name in presence of two subscribing witnesses.

JOHN M. HARTMAN.

Witnesses:

FRANCIS D. PASTORIUS,

LOUIS A. MÁTOS.