

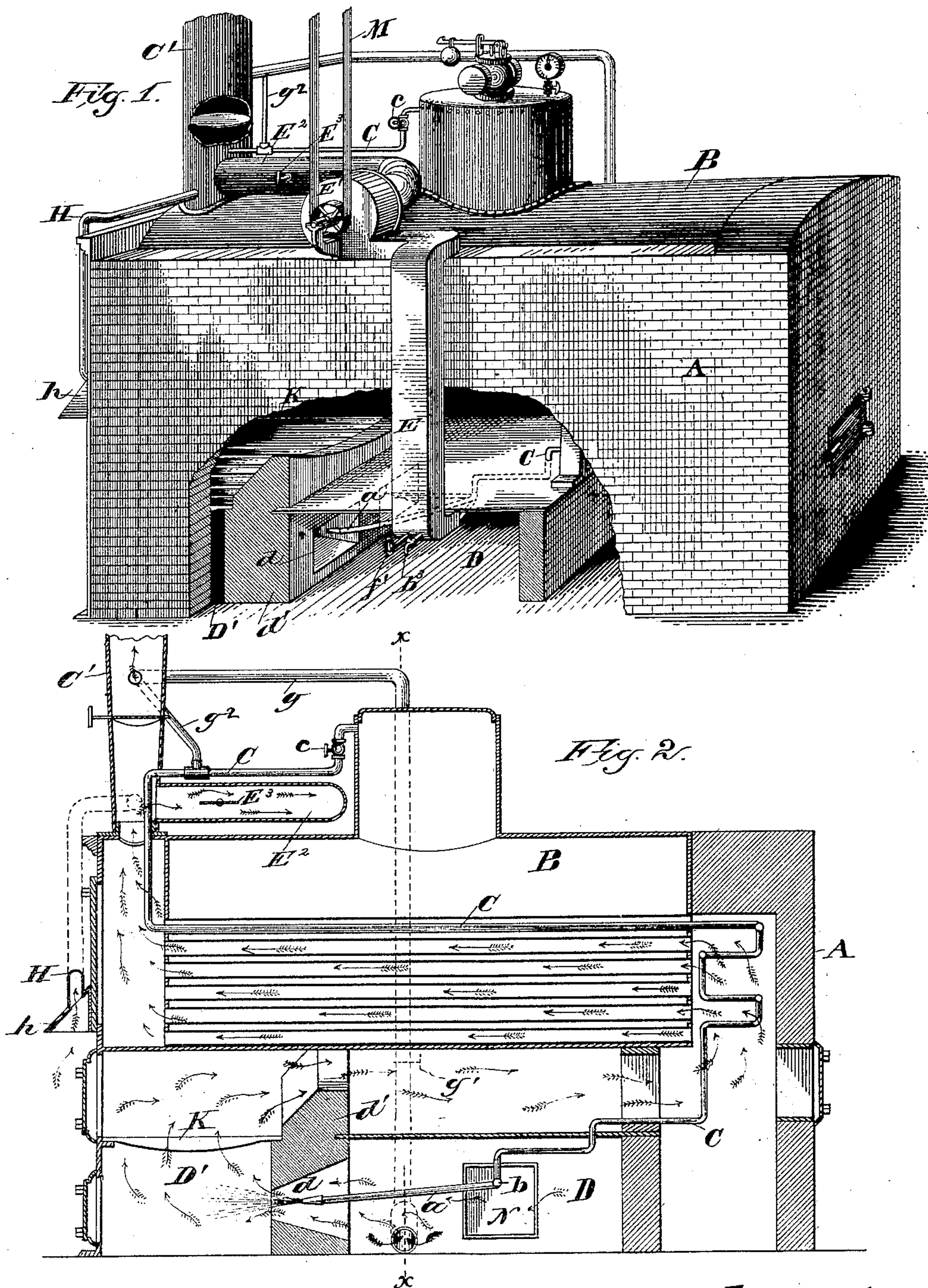
(No Model.)

2 Sheets—Sheet 1.

H. B. GREVE.
SMOKE CONSUMING FURNACE.

No. 325,207.

Patented Aug. 25, 1885.



Witnesses:
E. G. Somers
R. Platz

Inventor:
Henry B. Greve
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Attorneys

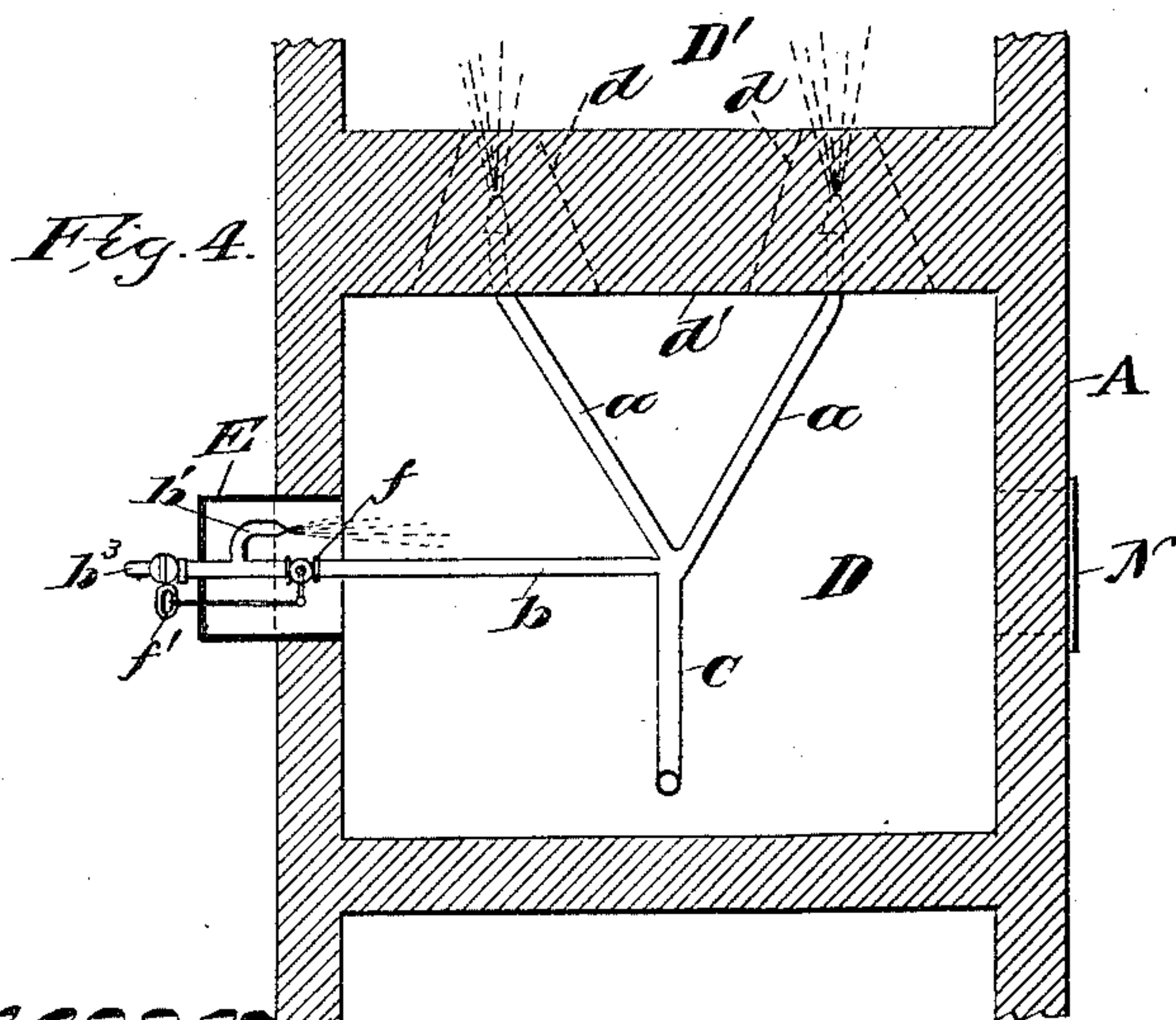
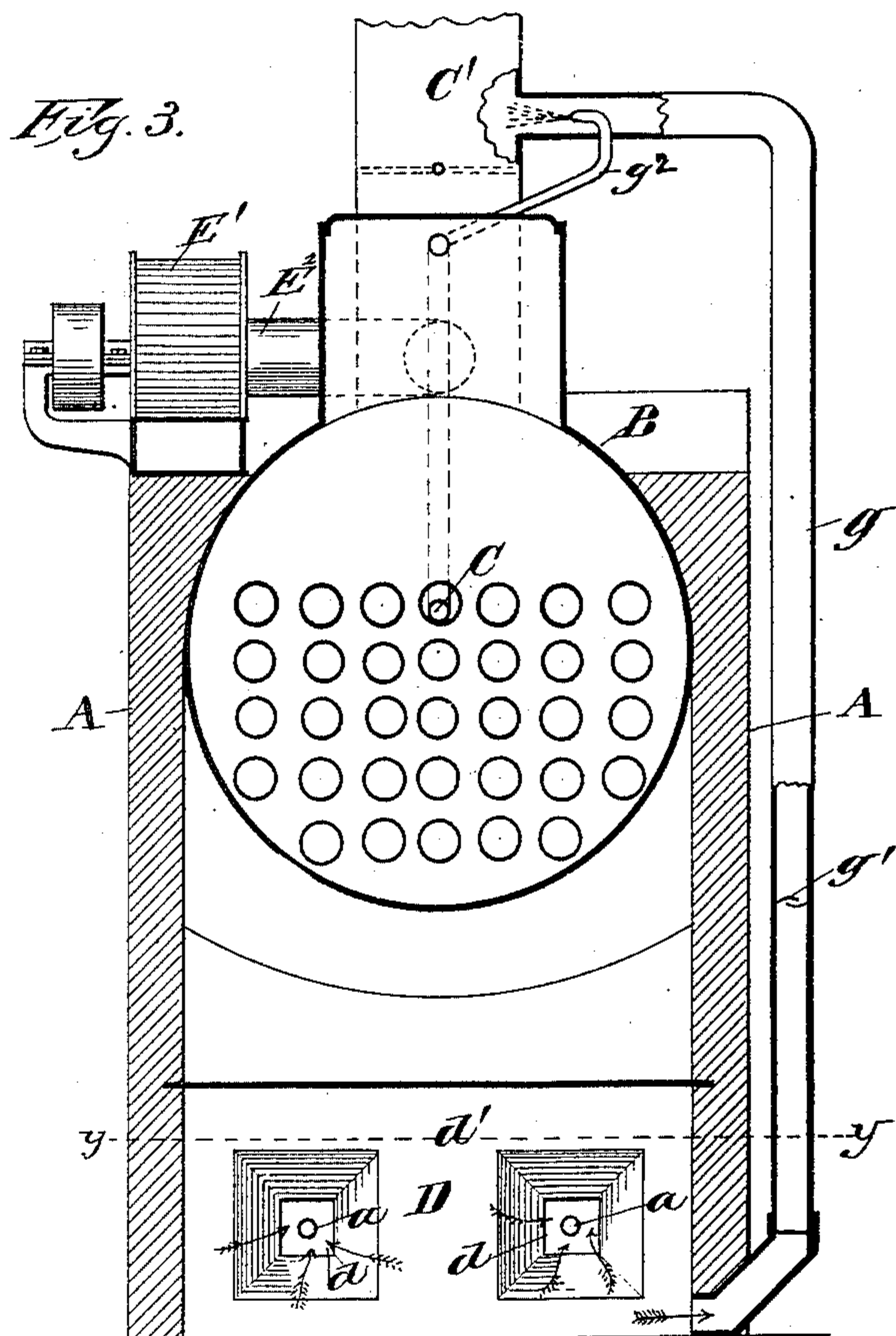
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Witnesses:
E. L. Ames
R. Platz

Inventor:
Henry B. Greve
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UNITED STATES PATENT OFFICE.

HENRY B. GREVE, OF MILWAUKEE, WISCONSIN.

SMOKE-CONSUMING FURNACE.

SPECIFICATION forming part of Letters Patent No. 325,207, dated August 25, 1885.

Application filed April 23, 1885. (No model.)

To all whom it may concern:

Be it known that I, HENRY B. GREVE, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Smoke-Consuming Furnaces; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to furnaces, and will be fully described hereinafter.

In the drawings, Figure 1 is a side view of a furnace embodying my improvement, with part of the wall broken away. Fig. 2 is a vertical longitudinal section through the center of the same. Fig. 3 is a section on line *x x*, Fig. 2, and Fig. 4 is a section on line *y y*, Fig. 3.

A represents the walls of the furnace; B, the boiler, and C a steam pipe that leads from the dome into the smoke-stack C', through the flue-chamber, around the rear of the flues, and thence down into a chamber, D, where it is branched, as at *a a* and *b*. Each of the branches *a a* extends into a tapered opening, *d*, in the wall *d'*, and the branch *b* extends into and through the open lower end of a flue, E, which flue extends up to a blower, E', which in turn is connected by a flue, E², with the base of the smoke-stack C'. The branch *b* of steam pipe C has a nozzle, *b'*, that points toward the center of chamber D. It also has a valve, *f*, that is controlled from the outside by a rod, *f'*, and after it has passed through the wall of flue E this branch terminates in a cock, *b³*, for draining the pipe when necessary. The chamber D forms a smoke and gas reservoir, and is connected with the smoke-stack C' by a pipe, *g*, that leads out of the lower portion of chamber D and enters the smoke-stack above its damper. The pipe *g* has a damper, *g'*, which should be always kept partly open, so as to prevent too much smoke and gas from collecting in the chamber. To utilize the fresh, warm air from the front of the furnace, I provide a pipe, H, having an inverted-funnel-shaped mouth, *h*, at its lower end, while its upper end enters the smoke-stack below the damper thereof.

N is a man-hole.

The operation of my device is as follows: The fire is started in the grate K with the smoke-stack damper open and the damper E³ in

pipe E² closed, in which condition they remain until the fire has progressed sufficiently for the generation of steam; but as soon as sufficient steam has been generated to start the machinery, and thus operate the fan through the belt M, then the smoke-stack damper is closed and the cock *c* of pipe C is opened, as well as damper E³, and the result will be as follows: The smoke and other gaseous products of combustion will be drawn by the blower from the grate around through the spaces through the boiler-flues, into the lower portion of the smoke-stack, and thence through pipe E², the blower-casing, and flue E to the mixing-chamber D, when it is reheated and mingled with a jet of superheated steam from nozzle *b'*, and is then drawn from the chamber D into the ash-pit D' beneath the grate by jets of superheated steam from branches *a a*, and thence by the draft from the blower E' up through the fire, to mingle with the fresh air from pipe H and be again returned to chamber D, and thus all the combustible gases will be consumed, while the heavy non-combustible gases will escape or be drawn up through pipe *g*.

My device may be adapted to marine and other styles of boilers or furnaces without departing from the spirit of my invention.

I propose to give to pipe C as many crooks and bends as possible, that it may take up the maximum amount of heat and more highly superheat the steam that passes through it. To increase the draft in pipe *g*, I may extend a jet-pipe, *g²*, from the boiler into its upper end.

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

1. In a smoke consuming attachment for furnaces, a smoke-chamber situated near the fire-bed, in combination with a blower and a flue connecting it with the combustion-chamber and another flue connecting it with the smoke-chamber, substantially as set forth.

2. The combination, with a flue leading into the smoke-stack, of another flue leading into a smoke chamber, an intermediate blower, a wall separating the smoke-chamber from the ash-pit, and passages connecting the smoke-chamber and ash-pit, as set forth.

3. The combination, with the smoke-cham-

ber, blower, and its flues, of a steam pipe leading from the top of the boiler into the smoke-stack and through the nest of flues and down into the smoke-chamber, as set forth.

4. The combination, with the smoke-chamber and smoke-stack, of a pipe, *g*, leading from the bottom of the smoke-chamber up into the smoke-stack above its damper, as set forth.

10 5. The combination, with chamber *D*, of pipe *g* and a steam-jet leading from the boiler into the upper end of pipe *g*.

6. The combination, in a furnace, of a pipe, *H*, the blower and its flues, and the smoke-chamber, as set forth.

15 In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

HENRY B. GREVE.

Witnesses:

S. S. STOUT,

H. J. FORSYTH.