(No Model.)

J. O. B. RICHARDS.

HOT BLAST STOVE.

No. 315,072. Patented Apr. 7, 1885.

Fig. 1.

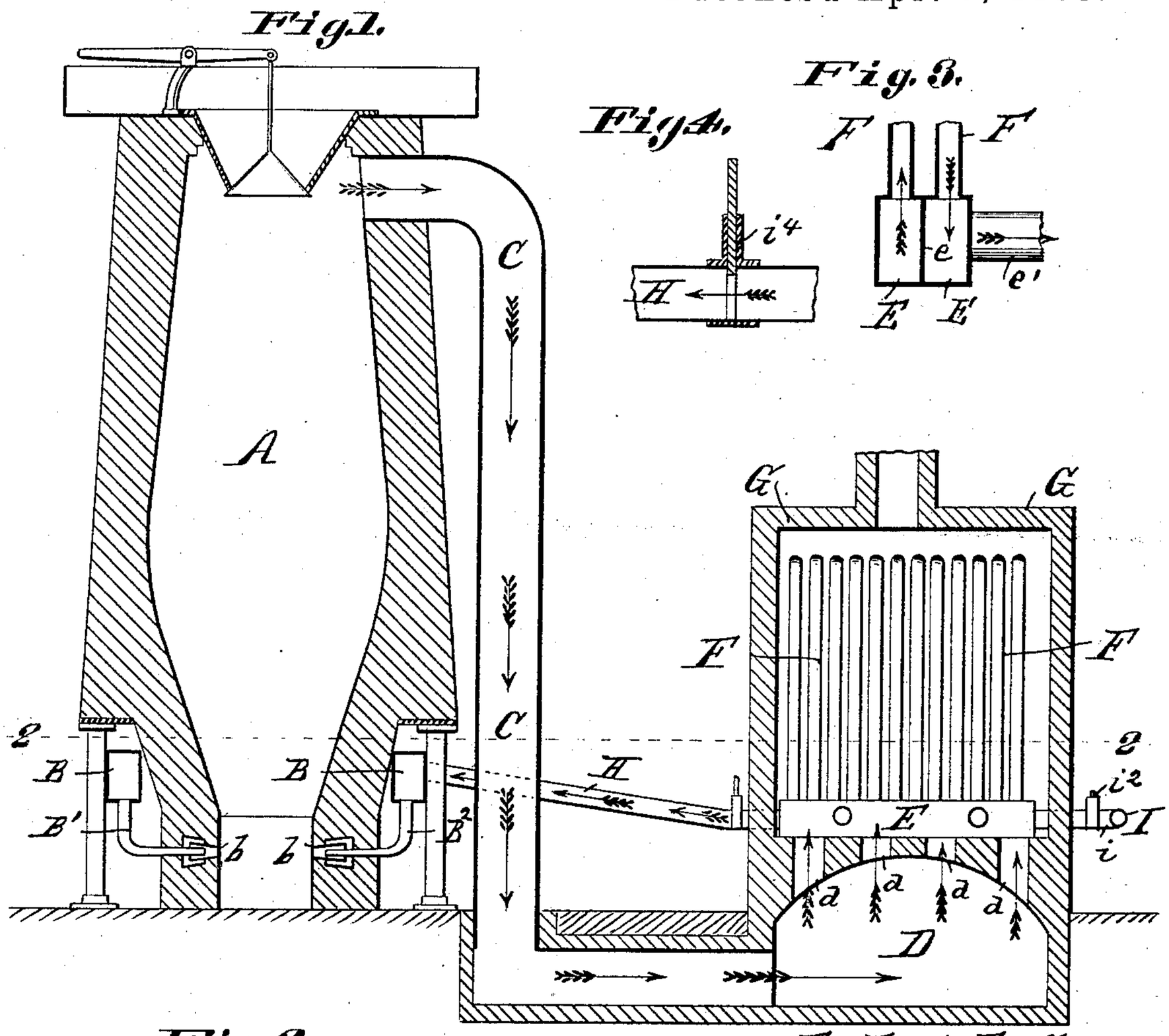
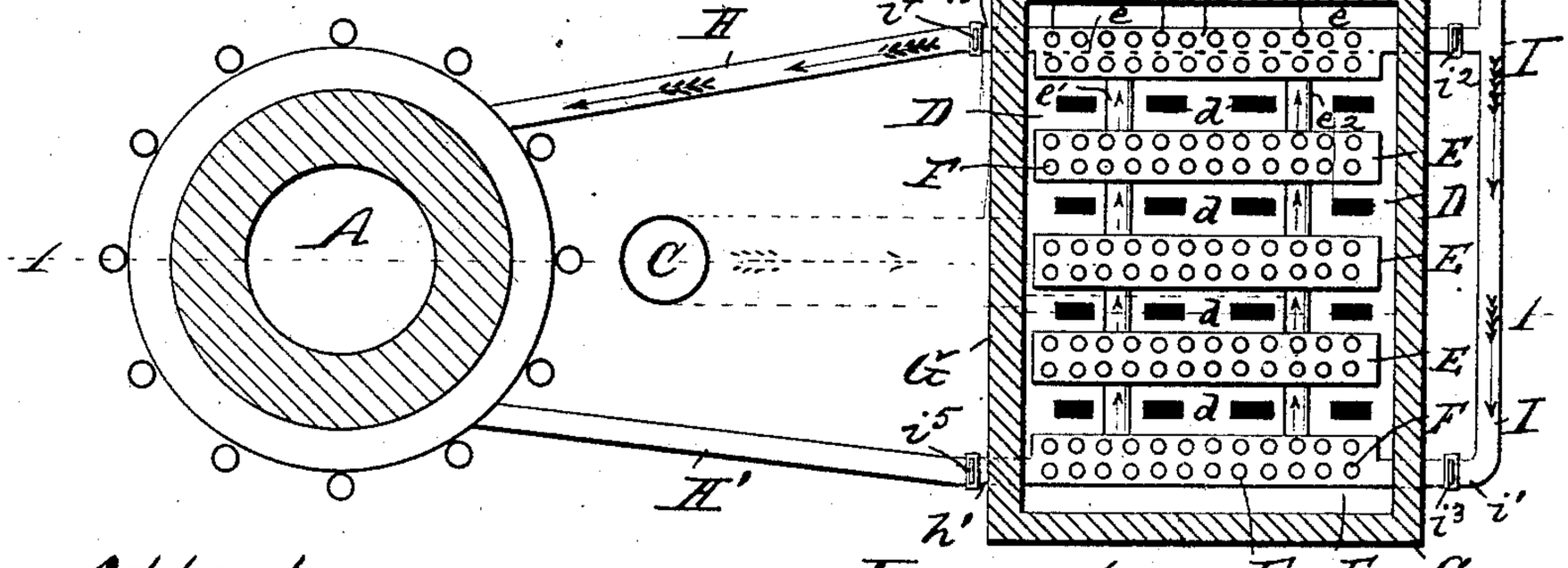


Fig. 3.

Fig. 2.



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UNITED STATES PATENT OFFICE.

JOSEPH O. B. RICHARDS, OF ST. LOUIS, MISSOURI.

HOT-BLAST STOVE.

SPECIFICATION forming part of Letters Patent No. 315,072, dated April 7, 1885.

Application filed November 17, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH O. B. RICHARDS, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented a new and useful Improvement in Hot-Blast Stoves for Blast-Furnaces, of which the following is a specification.

This invention relates to that class of hot-blast apparatus in which an independent oven receiving heat from the stack of any proper furnace is employed to heat the air-current on its way from the blower-engine to the furnace; and it consists in the special construction of the oven, and in the combination therewith of specially-arranged pipes, with proper valves for controlling the flow through the same, as will be fully described hereinafter.

In the drawings, Figure 1 is a sectional elevation of a blast-furnace and hot-blast oven having my improvement applied thereto; Fig. 2, a plan section of the same parts taken on the line 2 2, Fig. 1; Fig. 3, a detail view of the joint of two vertical pipes, the arrows indicating the direction of the hot-blast; Fig. 4, a detail view of one of the valves employed to control the flow through the pipes.

A represents an ordinary blast-furnace, having near the bottom of the same the main bustle-pipe B, with branch pipes B′ B² leading to the tuyeres *b b*, in the manner well understood.

C represents a pipe or flue leading from near the top of the furnace-stack to the bottom of the oven D, and discharging its gases and products of combustion into the latter through the openings *d d*, in the manner well understood.

E E represent bed-pipes extending across the oven from side to side, as shown in Fig. 2, near the bottom of the latter, as shown in Fig. 1.

e, Figs. 2 and 3, represents a partition extending through each of these pipes in a longitudinal direction, as shown.

F F represent arch-pipes of inverted-U shape, rising from the bed-pipes, and communicating therewith in the manner well understood.

e′ e² represent branch pipes, by means of which the independent bed-pipes are united together.

G represents the inclosing-wall of the oven.

H represents a discharge-pipe connected at one end, *h*, to what may be termed the "discharge end" of the extreme bed-pipe of the series at one end of the oven, and at the other to the bustle-pipe of the furnace.

H *h′* represent a pipe similarly arranged at the opposite end of the oven.

I represents an inlet-pipe leading from the blower-engine into the oven by means of branch pipes *i i′*, one branch, *i*, communicating with the same bed-pipe as the discharge-pipe H, but at the opposite or inlet end of the same, and the other branch pipe, *i′*, with the same bed-pipe as the discharge-pipe H′.

i² i³ represent gates or valves controlling the flow of the air through the branch pipes *i i′* into the oven, and *i⁴ i⁵* similar gates or valves controlling the flow out through the pipes H H′.

The operation of the described improvement is substantially as follows: A continuous current from the blower-engine in one direction is sent through the main inlet-pipe I, and this current is caused to pass through the heating-oven, first in one direction and then in the opposite direction, to prevent the undue heating of the oven-pipes, as follows: By closing the gates *i² i⁵* and opening the gates *i³ i⁴* the current from the blower-engine is caused to pass through the oven in the direction of the arrows, and out through the pipe H to the furnace. The cold air entering the first bed-pipe, E, through the branch pipe *i′* causes the pipes at this end of the oven to be comparatively cool. By closing the gates *i³ i⁴* and opening the gates *i² i⁵* the direction of the current through the oven is reversed and the pipes in the opposite end of the oven become comparatively cool. By reversing the current in this manner at proper intervals all the pipes of the oven may be kept from being overheated.

I am aware that it is old to reverse the direction of the air-current through the hot oven on its way to the furnace by changing the connection with the blower-engine from one end of the pipe system of the oven to the other, a corresponding change being made at the same time with the connection with the furnace.

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

The combination, with the oven D, of the bed-pipes E, the pipes at each end provided with openings extending entirely through the same, branch pipes e' e^2, and pipes F F, inlet-pipe I, with branches i i', the discharge-pipes H H′, and the valves i^2 i^3 i^4 i^5, as described.

In testimony of said invention I have hereunto set my hand.

JOSEPH O. B. RICHARDS.

Witnesses:
WILLIAM W. HERTHEL,
JOHN W. HERTHEL.