

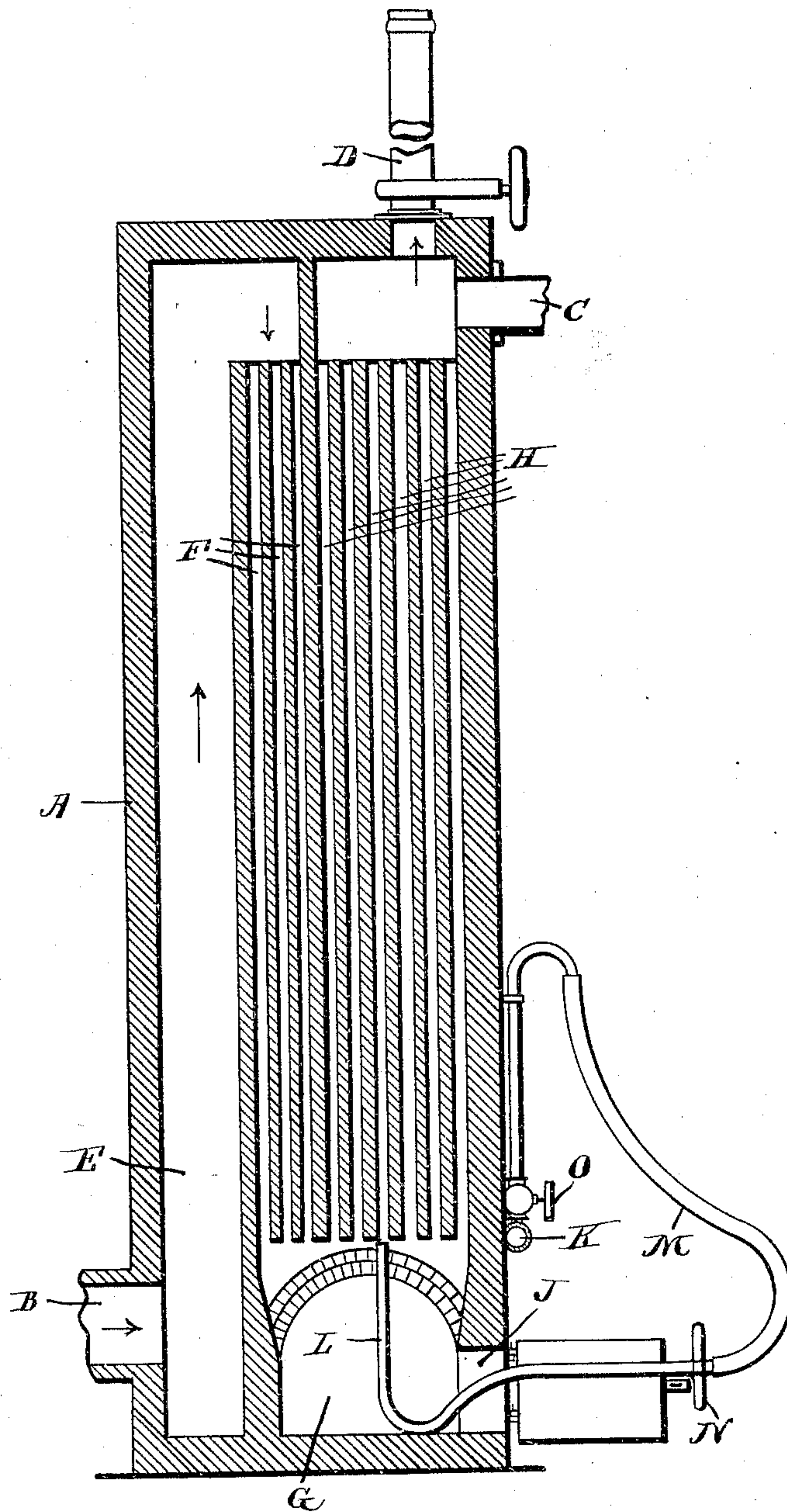
(No Model.)

F. W. GORDON.

METHOD OF CLEANING HOT BLAST STOVES.

No. 417,019.

Patented Dec. 10, 1889.



Witnesses:
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UNITED STATES PATENT OFFICE.

FRED. W. GORDON, OF PHILADELPHIA, PENNSYLVANIA.

METHOD OF CLEANING HOT-BLAST STOVES.

SPECIFICATION forming part of Letters Patent No. 417,019, dated December 10, 1889.

Application filed April 3, 1889. Serial No. 305,909. (No model.)

To all whom it may concern:

Be it known that I, FRED. W. GORDON, of Philadelphia, Philadelphia county, Pennsylvania, have invented certain new and useful
5 Improvements in the Method of Cleaning Hot-Blast Stoves, of which the following is a specification.

This invention pertains to methods for removing from regenerative hot-blast stoves
10 those deposits left by the gases upon the regenerator-walls, such deposits interfering with the free absorption and surrender of heat by the regenerator-walls.

In hot-blast stoves gases are admitted to
15 the combustion-chamber and ignited and the hot products pass through the regenerative brick-work and out through the chimney, the regenerative brick-work absorbing heat from the hot products of combustion. When the
20 brick-work is sufficiently heated, the heating operation is stopped and the gas cut off, and air or other fluid to be heated is passed through the stove, and the regenerative work surrenders its heat, or a portion of it, to the
25 passing fluid and heats it. The brick-work is again heated when required. The stoves are used in multiple, so that while one hot stove is giving up heat to the air passing through it another stove is being heated by
30 the burning gases. If the hot stove becomes cooled quicker than the cool one can become heated, it would be necessary to have three stoves to prevent interruption, and under all circumstances it becomes of the utmost importance that the operation of heating a cool stove
35 be interrupted as little as possible. The gas deposits foreign matters upon the regenerative surfaces, and these deposits lessen the efficiency of the stoves in absorbing and surrendering heat, and these deposits must be
40 removed, which is generally done by brushing, scraping, or blowing with air or steam blasts. Hot-blast stoves are often used in connection with blast-furnaces running continuously night and day, and the cleaning
45 must be done with the least possible interruption to the general furnace operations. The cleaning, when done in accordance with ordinary methods, requires that the stove
50 shall have its gas cut off and the stove be opened and allowed to cool sufficiently for

the cleaning operations. This requires considerable time and wastes considerable heat. By my improved method I clean the main
regenerator without loss of time or heat.

In cleaning by my improved method I cause
an upward draft of the hot products of combustion in the main portions of the regenerator. I open the stove at the foot of this portion of the regenerator. I inject a blast of
60 air or steam upwardly into the regenerator, and thereby loosen the deposits, which fall to the base of the regenerator. I then remove the deposit through the base-opening and close said opening, and all without interruption
65 to the heating of the stove.

My improved method may be more readily understood from the following description, taken in connection with the accompanying
drawing, which is a vertical section of a hot-
blast stove being cleaned by my method.

In the drawing, A represents the stove; B, the inlet for the heating-gases, which inlet is also used as the outlet for the heated fluid when the stove is employed in heating; C,
75 the inlet for the fluid to be heated; D, the chimney-connection at the top of the stove; E, the combustion chamber where the heating-gases burn and pass upwardly to the top of the stove; F, regenerator-passages conducting the heating-gases from the top of the
80 combustion-chamber down to the base of the stove; G, a chamber at the base of the stove under the regenerator; H, the main regenerator-passages, leading from this chamber up
85 to the chimney-connection; J, a cleaning-opening at the base of the stove, leading to the chamber at the foot of the regenerator; K, a pipe to be connected with a source of supply of steam or air under pressure; L, a jet-
90 pipe adapted to be inserted into the chamber G and direct the cleaning-jet upwardly into the regenerator-passages; M, a flexible pipe placing the cleaning-pipe L in connection with the pipe K; N, an inlet on the pipe L,
95 by which it may be manipulated from outside the stove, and O a valve for opening and closing communication with the cleaning-pipe.

Assume the cleaning-pipe to be out and the
opening J closed, and gas to be burning in
the combustion-chamber. The products of

combustion pass upward in the combustion-chamber, down the passages F, up the passages H, and out the chimney. It is to be understood, of course, that the air and gas connections with the stove are to be provided with the usual valve. The draft of the chimney produces an upward current through the main regenerator-passages H. Consequently the opening J may be opened and a current of air will enter that opening instead of heated gas issuing therefrom. The cleaning-pipe is now inserted through the opening and the steam or cleaning-air turned on and the jets directed up into the various passages H, loosening the deposits and causing them to fall to the floor of the chamber G. When the cleaning is completed, the cleaning-pipe may be removed, the deposits withdrawn, and the opening J closed. During the operation of cleaning the burning gases continue to pass through the stove and heat the same, there thus being no interruption to the heating process. By this means a stove may be cleaned, if desired, each time it is put under gas and the stove thereby kept in a condition of maximum efficiency; no time is lost in the cleaning operation and there is no necessity for any preliminary cooling of the stove, and the cleaning operation is free from danger to the operators.

The passage of the blast through the regenerative stoves has, of course, a cleaning tendency. This I do not claim as of my invention.

When the blast is shut off, the stove is of course left full of air under pressure, and

when the chimney-valve is opened preparatory to putting the stove under gas the contained air will, of course, by expansion, tend to a forcible discharge at the chimney, and this movement of the expanding air through the stove will have a cleaning tendency. I do not claim this process of cleaning stoves as of my invention.

It has been proposed to furnish the separate compartments with separate blast-admissions, so as to supplement the effect of the expansion at the moment of changing from blast to gas. I do not claim such method of cleaning stoves as of my invention. In my improved method I do not depend upon the cleaning being done while the stove is under blast and therefore not susceptible of being opened, nor do I depend on the utilization of the momentary interval during which the stove is being changed from blast to gas.

I claim as my invention—

The method of cleaning regenerative hot-blast stoves, which consists in passing burning gases through the stove, producing an upward draft to these gases through the main regenerator, opening the stove at the base thereof, directing a cleaning-jet upwardly into the regenerator at the base of the regenerator while the heating-gases are passing upward therein, and removing the loosened deposits from the base of the regenerator, substantially as set forth.

FRED. W. GORDON.

Witnesses:

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