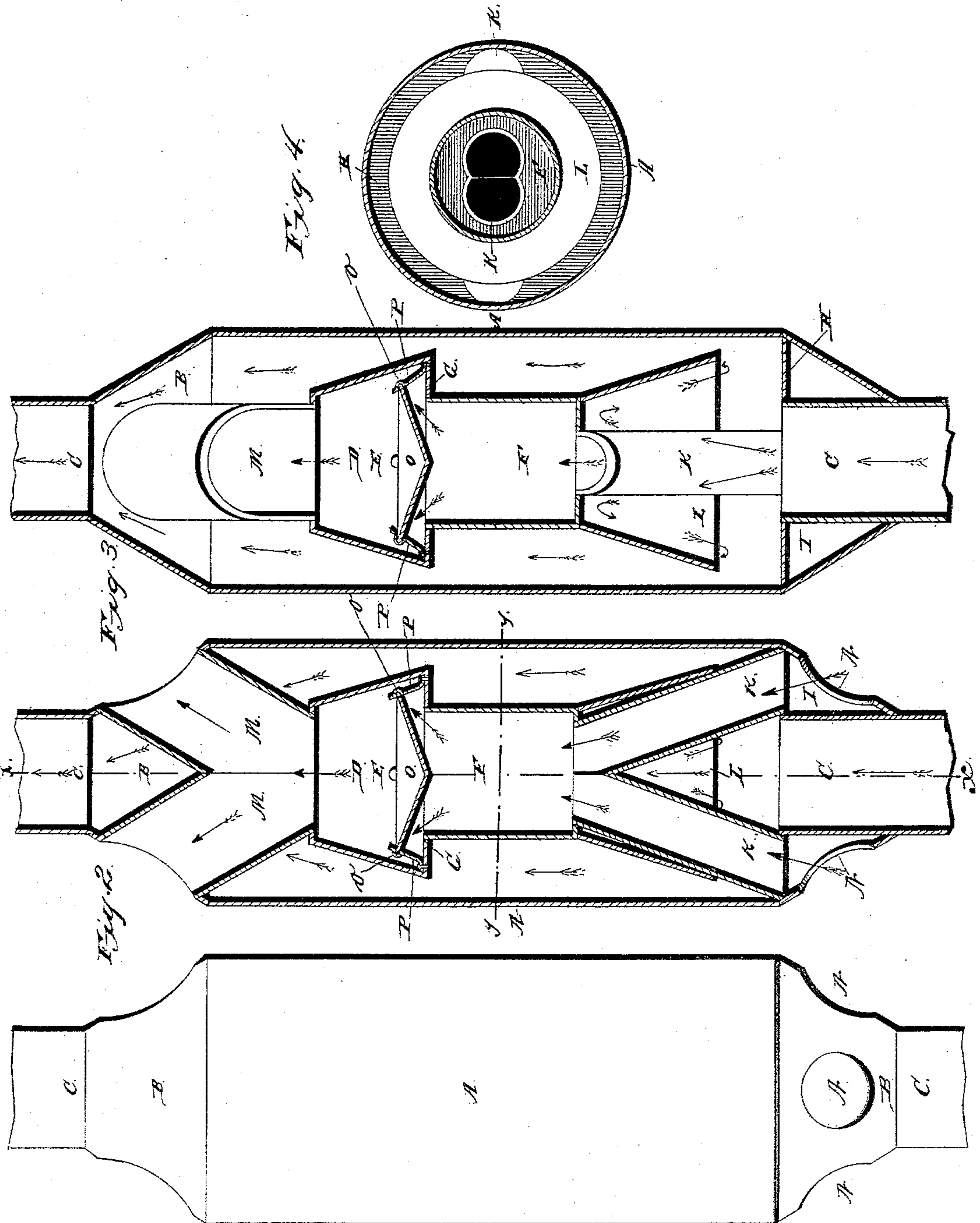


(No Model.)

J. J. SULLIVAN.  
HEATING DRUM.

No. 387,750.

Patented Aug. 14, 1888.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

JEREMIAH J. SULLIVAN, OF OSWEGO, NEW YORK.

## HEATING-DRUM.

SPECIFICATION forming part of Letters Patent No. 387,750, dated August 14, 1888.

Application filed March 2, 1888. Serial No. 265,902. (No model.)

*To all whom it may concern:*

Be it known that I, JEREMIAH J. SULLIVAN, a citizen of the United States, residing at Oswego, in the county of Oswego and State of New York, have invented new and useful Improvements in Heating-Drums, of which the following is a specification.

My invention relates to improvements in heating-drums; and it consists in a certain novel construction and arrangement of devices which are fully set forth hereinafter, and illustrated in the accompanying drawings, wherein—

Figure 1 is a side view of the improved heater. Fig. 2 is a vertical central section of the same. Fig. 3 is a similar view on the line *x x* of Fig. 2. Fig. 4 is a horizontal section on the line *y y*, Fig. 2.

Referring by letter to the drawings, A designates the outer casing or drum, having the conical caps B B on its upper and lower ends, in which are inserted the ends of the stove-pipes C C.

D represents the hot-air chamber, which comprises the conical upper compartment, E, and the cylindrical lower compartment, F, the lower end of the upper compartment being larger than the lower compartment, thus forming a shoulder, G. The lower end of the drum is closed by the plate H, thus cutting the space within the conical cap off from the interior of the drum and forming a separate receiving-chamber, I. The lower stove-pipe, which is above described as entering the lower conical cap, passes entirely through the said receiving-chamber and communicates with the interior of the drum.

K K represent small conducting-flues, which pass from the receiving-chamber (upon opposite sides of the lower smoke-pipe) to the lower end of the lower compartment of the hot-air chamber, thus establishing communication between the said chambers. These flues, although passing through and located in the drum, do not communicate therewith.

L represents a cone-shaped deflector, which depends from the lower end of the hot-air chamber around the upper ends of the conducting-flues, the said deflector being disposed directly over the upper end of the lower smoke-pipe. The mouth of the deflector is

larger than the pipe, and its lower edge comes within a short distance of the plate H at the lower end of the drum.

M M represent hot-air-discharge flues which communicate with the upper end of the upper compartment of the hot-air chamber, and they diverge toward their upper ends and pass through openings in the sides of the conical cap at the upper end of the drum.

Openings N N are formed in the sides of the lower conical cap, B, thus establishing communication between the receiving-chamber and the outside air. It will now be readily seen that a passage is formed directly through the heater from the receiving-chamber to the discharge-pipes; but the said passage is entirely isolated from the interior of the drum and the smoke-pipes which communicate therewith.

A deflecting-disk, O, is arranged in the upper compartment of the hot-air chamber close to the shoulder G, and its edges come close to the sides of the said upper compartment, therefore overlapping the shoulder. The disk is held in place by small spring clips or supports P P, which are attached to the said shoulder G, and are provided with small notches to engage the edges of the disk.

It will be evident that the annular opening O between the edge of the disk and the side of the hot-air chamber may be increased or diminished in size by altering its position vertically in the compartment E.

The operation of the heater is as follows: The smoke, gases, and other products of combustion pass up the lower smoke-flue and are projected into the conical deflector arranged above the upper end thereof, and this causes the said products to rebound and pass downward under the edge of the deflector. The smoke, gases, &c., then pass up through the body of the drum (around the hot-air chamber and the flues communicating therewith) and escape through the upper smoke-pipe. The progress of the products through the drum is impeded as much as possible without interfering materially with the draft, so as to deprive them of their heat. The deflector above the upper end of the lower smoke-pipe concentrates the heat upon the lower end of the hot-air chamber and the upper ends of the conducting-flues, which absorb a large propor-



tion of the heat. As the smoke passes up through the drum, the sides of the latter, as well as the sides of the hot-air chamber, absorb still more, and the shoulder at the upper end of the lower compartment of the hot-air chamber, (causing the smoke and gases to pass through a small annular opening,) and the upper conical cap, B, serve to confine the smoke, &c., until the remaining heat is extracted.

From the above it will be seen that much heat will be radiated from the sides of the body of the drum, and the heat which is absorbed by the sides of the hot-air chamber is radiated into the interior of the latter, thereby heating the air contained therein and causing it to rise. The said heated air passes from the hot-air chamber through the discharge-flues into the room, thereby causing the outside colder air to rush into the receiving-chamber through the openings in the sides thereof, and ascend through the conducting-flues into the hot-air chamber. It will be readily seen that as the air passes through the various parts of the passage through the drum, above described, it will become heated and pass out through the discharge-flues, thus causing a continuous current of air into the receiving-chamber and out of the discharge-flues.

The above-described disk in the hot-air chamber is designed to obstruct the passage of the air somewhat, so as to enable it to become thoroughly heated before passing out of the drum, and it is further designed to cause the air to pass close to the sides of the chamber from which the heat proceeds.

Having thus described my invention, I claim—

1. The combination of the drum having the pipes C C communicating with its upper and lower ends, the receiving-chamber located at the bottom of the drum around the lower pipe, C, the hot-air chamber located in the drum and communicating with the receiving-chamber through suitable pipes, K, and provided at an intermediate point with a shoulder or offset, forming an annular passage between its edges and the sides of the drum, and the outlet-flues M at the upper end of the hot-air chamber, substantially as and for the purpose specified.

2. The combination of the drum, the smoke-pipes, and the hot-air chamber located in the drum and comprising the upper conical compartment, E, communicating with the outside air through suitable outlet-tubes, and the lower compartment, F, communicating with the outside air through suitable inlet-tubes, and communicating with the upper compartment, E, through an annular opening, O, substantially as and for the purpose specified.

3. The combination, with the drum having smoke-pipes entering it at its upper and lower ends, respectively, of the hot-air chamber communicating at its opposite ends with the outside air and comprising the lower cylindrical compartment, F, and the upper conical compartment, E, having a shoulder, G,

at its lower end, and the deflecting-disk arranged above the said shoulder and forming an annular opening between its edges and the sides of the compartment, substantially as specified.

4. The combination, with the drum and the smoke-pipes communicating with the same, of the hot-air chamber within the drum, comprising the lower compartment, F, and the upper compartment, E, having a shoulder, G, between them, the spring clips or supports mounted on the said shoulder, and the deflecting-disk engaged at its edges by the said clips or supports, substantially as and for the purpose specified.

5. The combination of the drum, the conical caps B B on the upper and lower end thereof, the lower cap being provided with openings, the plate H at the lower end of the drum, between the same and the lower cap, B, the lower smoke-pipe passing through the lower conical cap and the said plate H, the upper smoke-pipe passing through the upper conical cap, the hot-air chamber located in the drum and out of communication therewith, the discharge-flues communicating with the upper end of the hot-air chamber and passing through the upper conical cap, and the conducting-flues K K, connecting the lower end of the hot-air chamber with the space within the lower conical cap, substantially as and for the purpose specified.

6. The combination, with the drum and the smoke-pipes, of the hot-air chamber isolated from the drum and having the discharge-flues communicating with its upper end, the conducting-flues passing from the lower end of the said chamber through the lower end of the drum on opposite sides of the lower smoke-pipe, and the conical deflector disposed over the upper end of the said lower smoke-pipe, substantially as and for the purpose specified.

7. The combination, with a drum provided with the smoke-pipes C C, communicating with its upper and lower ends, of the hot-air chamber communicating with the outside air through suitable inlet and outlet flues, K and M, respectively, and the conical deflector L, depending from the lower end of the hot-air chamber over the lower smoke-pipe, C, and surrounding the upper ends of the inlet-flues K, whereby the incoming heat from the said pipe is concentrated against the bottom of the hot-air chamber and the upper ends of the said flues, substantially as and for the purpose specified.

8. In combination with the drum A and the smoke-pipes entering the same at its upper and lower ends, respectively, of the hot-air chamber located in the interior of the drum, the conducting-flues communicating with the lower end of the said chamber and diverging at their lower ends, so as to pass through the lower end of the drum upon opposite sides of the lower smoke-pipe, the discharge-flues communicating with the upper end of the said chamber and diverging toward



their upper ends, and the conical deflector depending from the lower end of the hot-air chamber over the upper end of the lower smoke-pipe and embracing the upper ends of  
5 the conducting-flues, substantially as and for the purpose specified.

In testimony that I claim the foregoing as my

own I have hereto affixed my signature in presence of two witnesses.

JEREMIAH J. SULLIVAN.

Witnesses:

DENIS O'SULLIVAN,  
JOHN W. DECKER.