(No Model.)

J. B. FOX.

RADIATOR.

No. 551,489. Patented Dec. 17, 1895.

Fig. 1.

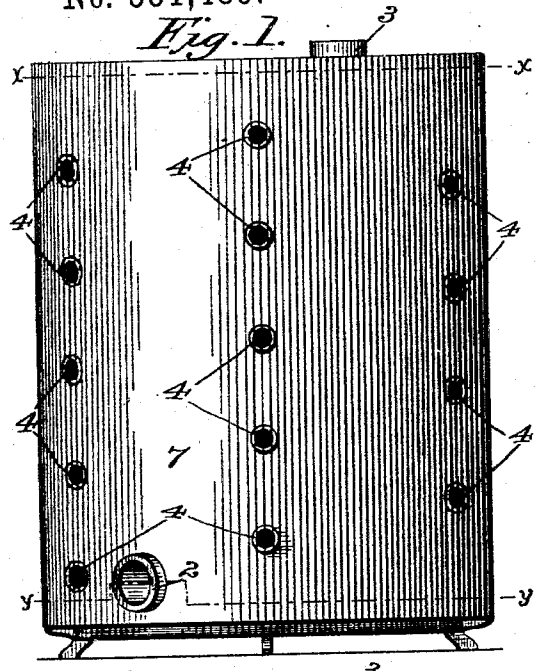


Fig. 2.

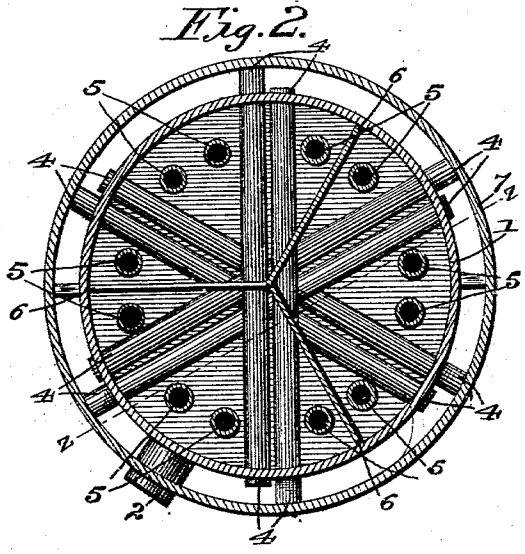


Fig. 3.

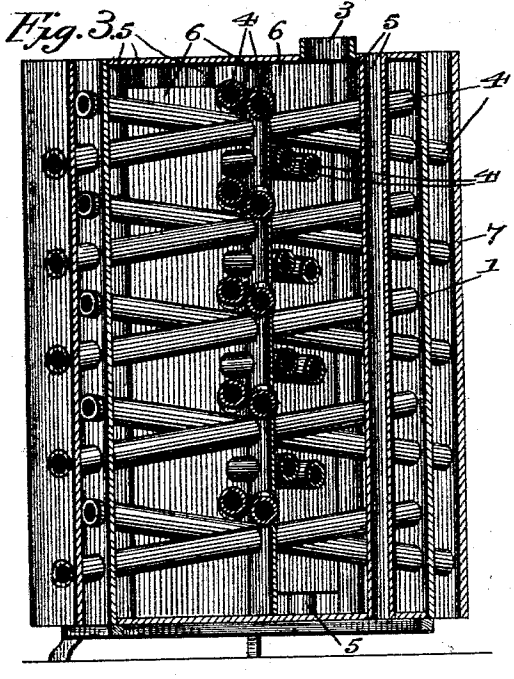
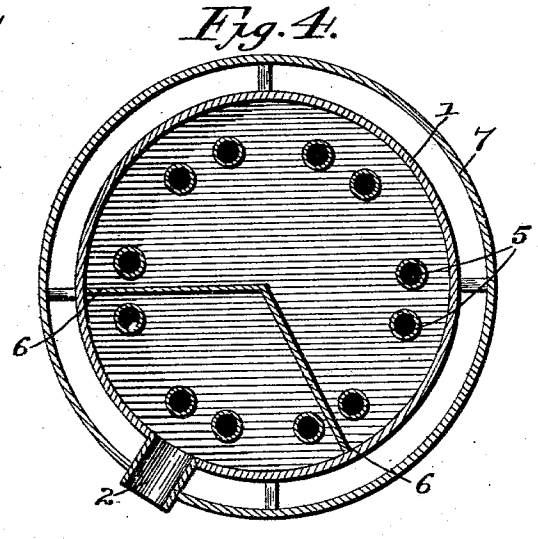


Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

JOSIAH B. FOX, OF SLATINGTON, PENNSYLVANIA.

RADIATOR.

SPECIFICATION forming part of Letters Patent No. 551,489, dated December 17, 1895.

Application filed July 8, 1895. Serial No. 555,235. (No model.)

To all whom it may concern:

Be it known that I, JOSIAH B. FOX, a citizen of the United States, residing at Slatington, in the county of Lehigh and State of Pennsylvania, have invented certain new and useful Improvements in Radiators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in radiators, the same being designed for the purpose of utilizing the waste products of combustion, which ordinarily pass out into the air from the chimney. In houses of two or more stories a fire built in a room on the first story can be made to heat those in the stories above by passing the waste products of combustion through the radiator and thence out through the chimney.

The invention consists of a drum divided off into three or more compartments, through which the waste gases pass, a series of lateral deflecting-pipes extending across said drum, arranged in pairs, the members of each pair being in parallel vertical planes, but set at an inclination with relation to the bottom of the drum for the purpose of drawing cold air in at the lower ends of said pipes and discharging heated air through the upper ends thereof. This drum may have a surrounding casing, cylindrical in form, for hiding the ends of the deflecting pipes or tubes and have the lower ends of said pipes project through.

The invention is clearly illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation of my device. Fig. 2 is a cross-section through the same. Fig. 3 is a vertical section taken on the line *x x* of Fig. 2. Fig. 4 is a cross-section taken on the line *y y* of Fig. 1.

Like reference-numerals indicate like parts in the various views.

The drum 1 of the radiator is made preferably cylindrical in form, of sheet metal, has an inlet-opening 2 at the bottom, through which the products of combustion from any suitable source are led into the drum, and an exhaust-opening 3 at the top, through which the waste gases are led back to the chimney and discharged into the air. The drum 1 has a series of hot-air deflectors 4 4 extending through the same, the said deflectors being arranged in pairs, the members of which are in parallel vertical planes, but are set at an angle to the bottom of the drum 1. The lower ends of these deflecting-pipes project through the outside of the drum 1 in order to take in cool air and also to prevent the air discharged from the upper end of the lower pipes 4 from being admitted to the lower ends of the upper pipes. I also provide a series of vertical pipes 5 in the drum 1, which increase the radiating-surface and tend to further utilize the heat contained in the waste gases passing through the drum. These have inlet-openings in the bottom and outlet-openings in the top of said drum. A series of vertical partitions 6 are arranged in the drum 1, dividing the same off into compartments, as shown. The drawings illustrate three compartments, and this number I prefer to use. These partitions are so arranged that the products of combustion entering through the inlet-opening 2 pass up through one of the compartments made thereby, down through the adjacent compartment, and up through the remaining one, passing out through the discharge-opening 3 in the upper end of the drum. By this construction the waste gases are forced to pass through the drum three times, so that all the heat possible contained therein may be utilized for heating the air in the deflecting-pipes 4. On the outside of the drum 1 I may, if I prefer, place a protecting-casing 7, which is cylindrical in form, open at top and bottom and supported upon lugs or projections extending outwardly from the drum 1. When this protecting-casing is used the lower ends of the deflecting-pipes 4 may be passed through an opening in said casing.

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

1. In a device of the character set forth, the combination of a cylindrical drum having an inlet opening at the bottom for admitting the products of combustion, and an outlet opening at the top for discharging the same, and a series of deflecting pipes passing transversely through said drum, arranged in pairs, the members of each pair being in parallel horizontal planes and set at an angle to the base of said drum and oppositely inclined to

the adjacent one, substantially as and for the purpose described.

2. In a device of the character set forth, the combination of a cylindrical drum having an inlet opening at the bottom for admitting the products of combustion, and an outlet opening at the top for discharging the same, a series of deflecting pipes passing transversely through said drum, arranged in pairs, the members of each pair being in parallel horizontal planes and set at an angle to the base of said drum and inclined oppositely to those of the adjoining pair, and a series of vertical pipes set in the space between the outer ends of the adjacent lateral deflecting pipes.

3. In a device of the character set forth, the combination of a drum having an inlet opening at the bottom for the entrance of the products of combustion, and an outlet opening at the top for the discharge of the same, vertical partitions in said drum dividing the same off into compartments through each of which the products of combustion are forced to pass, and a series of deflecting pipes passing transversely through said drum, arranged in pairs, the members of each pair being in parallel horizontal planes and set at an angle to the base of said drum and at an inclination opposite to those of the adjoining pairs, substantially as and for the purpose described.

4. In a device of the character set forth, the combination of a drum having an inlet opening at the bottom for the entrance of the products of combustion, and a discharge opening at the top, a series of vertical partitions dividing said drum off into a series of compartments leading one within the other, whereby the products of combustion are forced to pass through the drum a number of times equal to the number of said compartments, a series of deflecting pipes passing transversely through said drum arranged in pairs, the members of each pair being in parallel horizontal planes and set at an angle to the base of the drum, and a protecting casing for said drum, surrounding the same, open at the top and bottom and having the lower ends of each of said deflecting pipes projecting through the same, substantially as and for the purpose described.

5. In a device of the character set forth, the combination with the drum, of vertical pipes extended therethrough and open at both ends and independent deflector pipes supported in the walls of said drum and arranged in oppositely disposed inclined planes with their ends open, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOSIAH B. FOX.

Witnesses:
S. H. SCHNECK,
DAVID MCKENNA.