D. McALLISTER.

AIR-HEATING ATTACHMENT.

No. 188,159. Patented March 6, 1877.

Fig. 1.

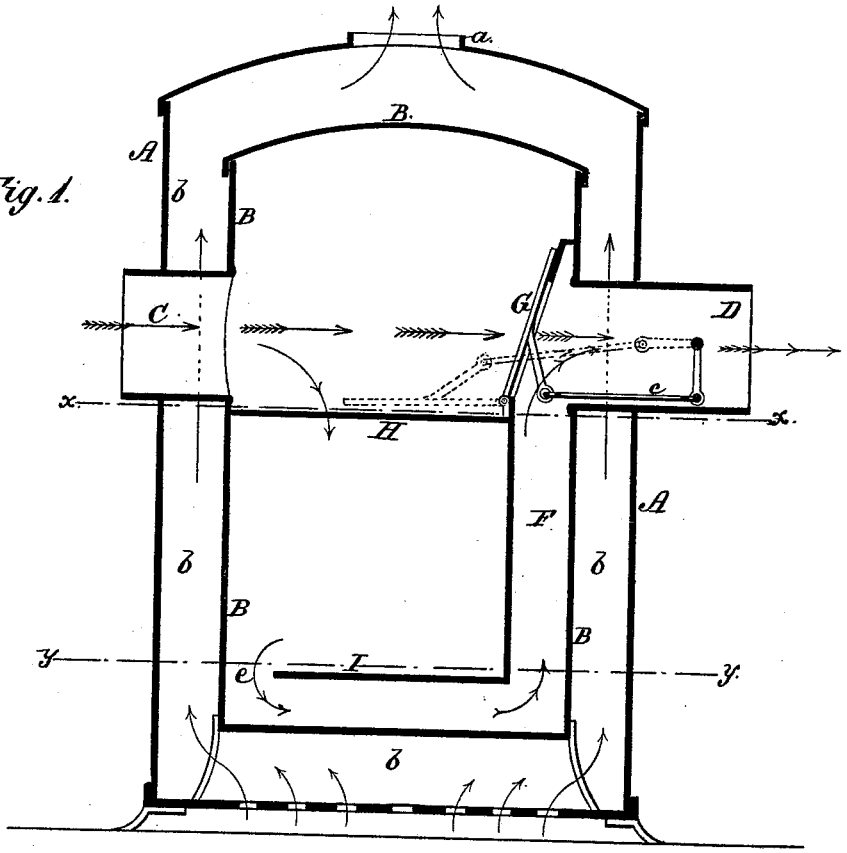


Fig. 2.

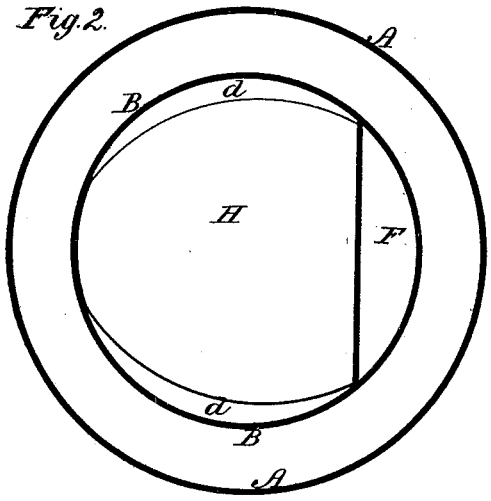
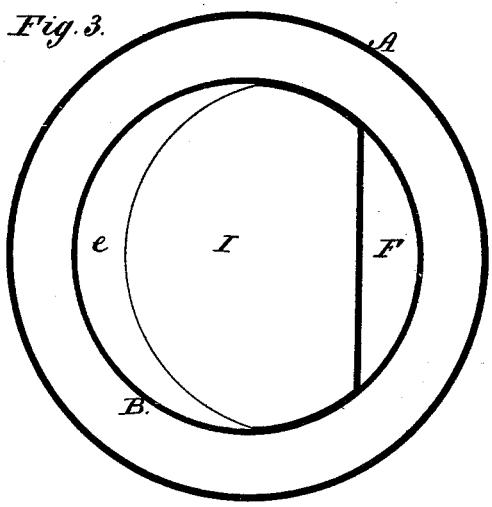


Fig. 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

DAVID McALLISTER, OF WALTON, NEW YORK.

IMPROVEMENT IN AIR-HEATING ATTACHMENTS.

Specification forming part of Letters Patent No. **188,159**, dated March 6, 1877; application filed February 20, 1877.

To all whom it may concern:

Be it known that I, DAVID McALLISTER, of Walton, in the county of Delaware and State of New York, have invented a new and Improved Air-Heating Attachment for Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the same.

The object of my invention is to furnish an improved attachment for hot-air or other furnaces, for the purpose of utilizing and economizing the heat which ordinarily escapes into the flue and is thereby wasted.

The device is simple and inexpensive in construction, being formed by combining two drums of different size, one being placed within the other, and also provided with partitions or diaphragms of peculiar form, for directing the course of products of combustion in such manner as to most completely eliminate the heat, and thus attain the most economical result.

For details of construction and arrangement of parts reference is made to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a sectional elevation of my improved furnace attachment, and Figs. 2 and 3 are cross-sections thereof on lines *x x* and *y y*, respectively, of Fig. 1.

The outer drum A is open or perforated at the bottom, and provided with a collar, *a*, around the opening in the top, to which a pipe may be attached to conduct the heated air to an apartment or elsewhere, as occasion may require. The inner drum B is closed at both top and bottom, and made concentric with drum A, from which it is separated by a narrow space, *b*, forming the annular passage for cold air, whose course is indicated by single-headed arrows. The furnace pipe or flue C passes through the outer drum A, and joins the side of the inner drum B, near its top. The exit-pipe flange B is similarly arranged, and connected on the opposite side of the respective drums. The course of the products of combustion from the furnace to the chimney may therefore be direct through the drums A B from pipe-flange C to flange D, as indicated by the feathered arrows. In such case, it is obvious, a comparatively small amount of heat will be absorbed from the products of combustion; but when it is desired to extract more or all, the course of the same is changed, as I will proceed to describe.

The inner drum B is provided with a vertical flue-pipe, F, which extends from a point near the bottom thereof to the junction of the pipe-flange D. A hinged valve or regulator, G, is so placed, with relation to openings D and F, that it may be operated by a rod, *c*, either to close the pipe F, or to close the opening by which products of combustion pass directly from C to D; hence, when the valve is in the latter position, as shown by full lines, Fig. 1, the products of combustion take the indirect or circuitous course, to wit, from the point C, where the furnace-pipe is attached, downward to the mouth of the vertical pipe F, and thence escape into the exit-flue D, as indicated by the double-headed arrows. It is, however, apparent that to cause the absorption of the greatest quantity of heat from the products of combustion they must be correspondingly caused to come in contact with as large an extent of the surface of the inner drum B as possible. To this end I provide the diaphragms H and I, which are placed horizontally within the drum B. The upper diaphragm is cut away on the sides at *d*, Fig. 2, to form crescent-shaped openings between them and the sides of the drum. It is placed just below the flanges C D, and permanently attached to the drum at both ends. The lower diaphragm I is placed a short distance above the bottom of drum B, and is attached to but one side of the latter. It is cut away at the other end, and also a short distance on the sides, thus forming a crescent-shaped opening, *e*, so that the products of combustion will pass around both the ends and sides of the same. When the valve G is closed, as in Fig. 1, the products of combustion are separated by the diaphragm H into two currents, which reunite in passing around the end of diaphragm I. The products of combustion are thus caused to come in contact with the sides and bottom of the drum B, which secures thorough absorption of heat. This result is attained by simple and inexpensive means, and the draft may be perfectly regulated by the valve G.

The device or attachment therefore com-

bines the two most desirable elements—cheapness of construction and efficiency of operation.

The drawing represents the attachment as circular in cross-section; but in practice I propose making it oval or ellipsoidal. I also purpose, in some cases, dispensing with the pipe-flange C, and inserting the furnace-pipe in the opening thus formed.

I do not claim, broadly, a heating device having deflecting-plates and a regulator for changing the course of the products of combustion; but

What I do claim is—

The improved air-heating attachment for furnaces, consisting of the inner drum or cylinder B, having closed ends, and provided with the diaphragms H and I, cutaway to form the respective crescent-shaped openings *d d* and *e*, the vertical pipe F, the regulator G, and the outer drum or cylinder A, open at each end, and the circular flanges C D of the furnace and exit-flues, all combined as shown and described.

The above specification of my invention signed by me this 14th day of February, 1877.

DAVID McALLISTER.

Witnesses:
AMOS W. HART,
CHAS. A. PETTIT.