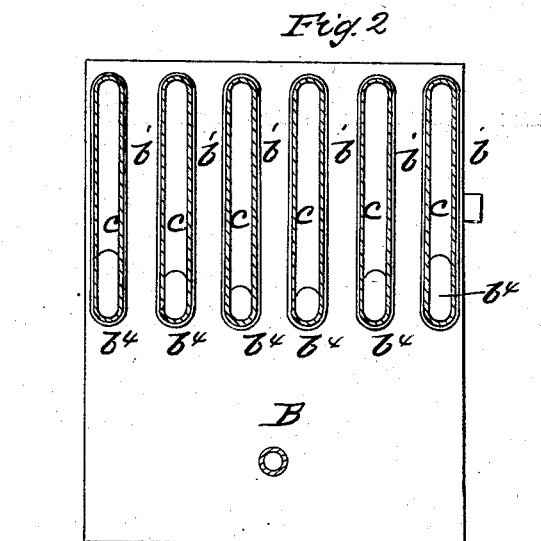
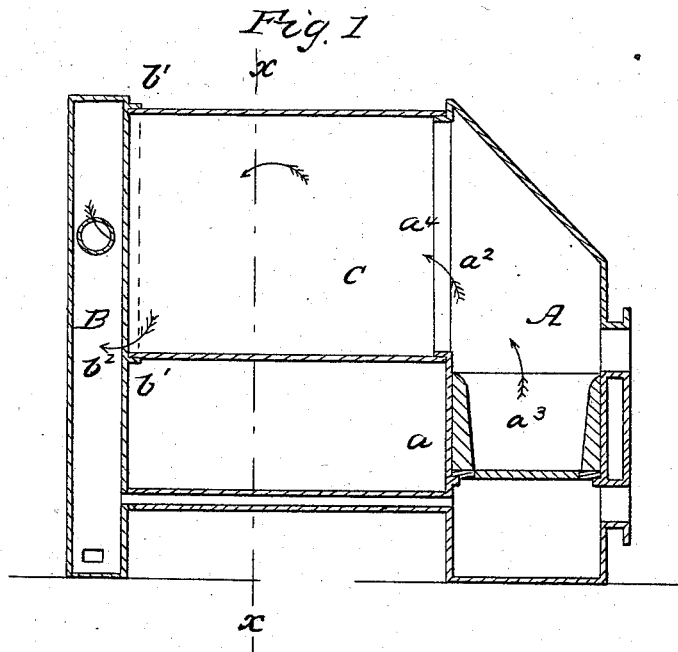


J. LEEDS.

Furnace.

No. 47,963.

Patented May 30, 1865.



Witnesses  
Omy Morrison  
R. P. Schuttk

Inventor  
Joseph Leeds.

# UNITED STATES PATENT OFFICE.

JOSEPH LEEDS, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN FURNACES.

Specification forming part of Letters Patent No. 47,963, dated May 30, 1865.

### *To all whom it may concern:*

Be it known that I, JOSEPH LEEDS, of the city of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in Furnaces for Air-Heaters; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical longitudinal section of the said improvement applied; and Fig. 2, a transverse section on the dotted line *x* of Fig. 1, showing the rear portion of the same, like letters of reference indicating the same parts when in both figures.

My improvement relates to those furnaces or stoves which are designed to be inclosed by brick walls, so as to produce heaters for warming air for dwellings, &c., and has for its object the economy of both fuel and space with simplicity of construction.

It consists, substantially as hereinafter described and specified, in connecting together the fire-chamber and the escape-flue chamber exclusively by means of a series of flat longitudinally-arranged smoke or gas flues having their flat sides vertical and parallel with each other, their front ends in full open communication with the fire-chamber, and their rear ends partially closed, while their outer surfaces are entirely exposed to the free air of the usual inclosing brick chamber.

In the drawings, A is the fire-chamber; B, the escape-flue chamber, and C C the flat longitudinally-arranged smoke or gas flues. The general form and construction of the parts A and B are in this instance like the same parts described in the specification accompanying the patent granted to me for an "Improvement in Furnaces for Heaters," dated April 2, 1861, with the exception that the width of the escape-flue chamber B is made to correspond with the width of the fire-chamber A, for the purpose of allowing the series of the flat gas or smoke flues C C to be arranged parallel with each other. The back plate, *a'*, of the chamber A has a series of narrow vertical slots, *a²*, made through it, from one side to the other of the plate, each of which commences from near the top of the

fire-box lining *a³*, and extends vertically upward nearly to the top of the chamber. The said slots are each bounded by a flange, *a'*, for receiving tightly over them the front ends of the respective gas or smoke flues C C. The front plate of the chamber B has also a series of flanges, *b'*, which correspond in form and position with the flanges *a'* when the chambers A and B are placed directly opposite to each other, as in Fig. 1; but instead of having slots therein to correspond in length with those of the chamber A, comparatively short openings *b² b³ b⁴* are made at their lower ends only, the lengths of the said openings increasing from the middle to the outer ones, respectively, as indicated in Fig. 2. The flues C C connect the chambers A B together by being fitted and cemented air-tight over the flanges *a'* of chamber A and within the flanges *b'* of chamber B, thus producing a series of parallel flat longitudinally-arranged flues which will conduct the hot gas and smoke from the fire-chamber A to the escape-flue chamber B in the directions of the arrows in Fig. 1; and the outlet-openings *b² b³ b⁴* of the flues C C being at the lower edges of the flues and much shorter than their inlet-openings *a²*, the heated products of combustion from the fire-chamber A will be retarded in their progress through them, thus permitting more of the heat of the said products to be radiated from the external surfaces of the flues.

The object of diminishing the lengths of the outlets of the flues C C from the outer to the inner ones, respectively, as seen in Fig. 2, is to equalize the draft through the whole of them, the heat coming from the middle of the fire-box being stronger than that from either side.

It will be readily seen that in this construction and arrangement of the smoke or gas flues a greatly increased radiating surface is afforded without materially increasing the space in which they are required, thus economizing the fuel relatively, and that the construction is comparatively simple, and the arrangement does not require any boxing or inclosing plates heretofore required around the smoke or gas flues.

Having thus fully described my improve-

ment, what I claim as new therein of my invention, and desire to secure by Letters Patent, is—

Connecting together the fire-chamber and the escape-flue chamber of furnaces or stoves for air-heaters by means of the series of flat smoke or gas flues C C, the said flues being

constructed and arranged substantially in the manner described and set forth, for the purposes specified.

JOSEPH LEEDS.

Witnesses:

BENJ. MORISON,  
R. F. SHATTUCK.