

UNITED STATES PATENT OFFICE.

JNO. BARKER, OF BALTIMORE, MARYLAND.

AIR-HEATING FURNACE.

Specification of Letters Patent No. 4,622, dated July 7, 1846.

To all whom it may concern:

Be it known that I, JOHN BARKER, of the city of Baltimore, in the State of Maryland, have invented certain new and useful
5 Improvements in the Manner of Constructing an Air-Heating Furnace for the Warming of Buildings; and I do hereby declare that the following is a full and exact description thereof.

10 My air heating furnace is to be inclosed in a chamber of masonry in the ordinary manner of placing such furnaces; and the air that is heated therein is to be conveyed through suitable tubes to the apartments to
15 be heated as usual. But I have so arranged the pipes which conduct the heated air from the furnace to the chimney, as that the cold air which is admitted from without, and which is to be heated by said pipes shall be
20 forced into immediate contact with them, by causing it to pass up within channels formed in the brick work which is made nearly to inclose said pipes. Of these air heating pipes, I employ a single tier only
25 on each side of the heating chamber, and that as near to the floor as they can be placed with convenience and nearly surrounding its four sides.

30 In the accompanying drawings Figure 1, is a plan of the interior of the furnace, supposing its upper part to be removed, and the eye to be looking directly down upon it. Fig. 2 is a vertical section of the whole structure in the line $x x$ of Fig. 1.

35 A, is the furnace which is to contain the fuel, and B the feeding trunk, or aperture leading into it, which is to be closed by a door under an arch C, in the ordinary way.

D is the ash-pit.

40 E, F, G and G' (seen in part also in Fig. 2,) are the air heating pipes, the three former of which are made to pass horizontally around the larger portion of the hot air chamber and near to its floor.

45 H, H, is the pipe leading directly from the furnace into the end of the horizontal pipe E, along which the heated air from said furnace passes in the direction of the arrow to the pipe F, then along the front of the chamber through the pipe G' to the pipe G. The pipe G' is shown separately in Fig. 3 where it is represented as kneed, so as to pass over the feeding trunk B; or it may be passed under said trunk and near
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to the floor of the chamber like the pipes E 55
F and G.

I I are the walls and arch of the inner or air heating chamber within an inch or two of which the pipes E F and G are placed; and within this wall I erect a line 60
or low wall of brick work, J J within about the same distance of the air heating pipes and extending an inch and a half or two inches above them. The upper bricks of this wall, and also a row of bricks I' 65
extending from the wall I, may comb over the upper part of the air heating pipes E F G, so as to diminish the opening between the two walls above the pipes, and to force the air which is to be heated by them to pass 70
nearly in contact with them. Fig. 4 shows the bottom part of one of the walls I; the openings K being for the admission of the air that is to be heated which passes in from the spaces L L between the walls of the two 75
chambers.

For the purpose of readily cleaning out the air heating pipes, I allow them to extend through the walls of both chambers, as shown at M M where they are furnished 80
with close fitting doors or stoppers which may be opened at pleasure.

N is an opening in the upper part of the air heating chamber, from which the heated air may be distributed wherever it is re- 85
quired.

O is the escape pipe leading from the pipe G into a flue, or chimney.

By arranging the air heating pipes in a single tier around the air heating chamber, 90
near to its floor, and inclosing them in suitable spaces formed by the brick work, the cold air that is admitted is brought into immediate contact with these pipes, thereby exhausting them of so much of their heat as 95
merely to leave sufficient air to create the draft necessary to keep the fuel in the required state of combustion. It has been experimentally found also, that under this arrangement of the air heating pipes, the fuel 100
may be subjected to a much slower combustion than is found necessary in other constructions of apparatus for a like purpose, thus not only insuring its durability, but preventing that deterioration of the air 105
which is always produced by pipes that are highly heated.

Having thus fully described the manner

in which I construct and arrange the respective parts of my air heating furnace, what I claim therein as new and desire to secure by Letters Patent, is—

5 The particular manner in which I have arranged the air heating pipes inclosed in spaces formed of masonry on each of their sides, and extending partly over them, with an opening at top for the passage of the

heated air; said pipes forming a single tier 10 within a few inches of the bottom of the air chamber; the whole construction and operation being substantially the same with that herein set forth.

JOHN BARKER.

Witnesses:

A. B. WOLFE,
ALEX YEARLEY.