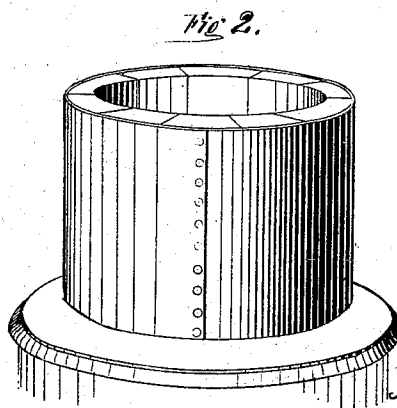
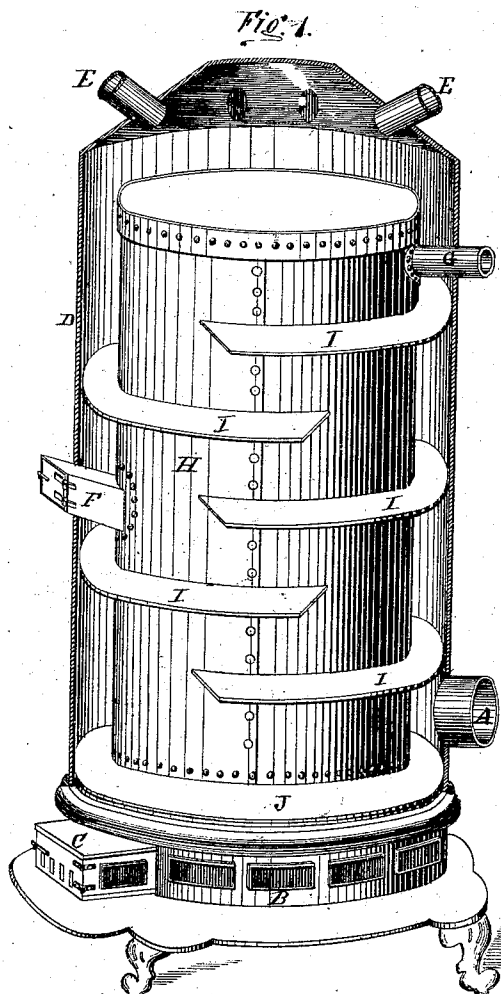


J. R. NICHOLS.  
Hot-Air Furnace.

No. 113,197.

Patented Mar. 28, 1871.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

JAMES R. NICHOLS, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. **113,197**, dated March 28, 1871.

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

Be it known that I, JAMES R. NICHOLS, of the city of Boston, county of Suffolk, and State of Massachusetts, have invented a new and useful Improvement in Air Stoves or Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing, making a part of this specification.

Hitherto, in the construction of cast-iron furnaces, it has been demonstrated that the gaseous products of combustion do pass through the cast-iron under certain conditions, and that some portions of the cast-iron work are more readily permeable to gases than others, being of unequal density and the joints imperfectly united, and also that such furnaces or stoves should not be made in part of cast-iron and in part of wrought-iron, for the reason that wherever the two come together there oxidation goes on with great energy, and that in the summer months, when such stoves or furnaces are not in use, the dirt or ashes deposited about the joints become moist, and wherever their iron pipes are connected with cast-iron shoulders there the work of oxidation goes on, and the whole is soon injured and destroyed.

The objections to and defects in the present and common mode of construction of furnaces, &c., are as follows: First, the employment of cast-iron in the interior construction; second, the presence of joints in the air-chamber which cannot be made perfectly tight by lutes or cements; third, arranging the air-chambers or flues so that ashes and dust can pass into the air-current; fourth, the imperfect arrangement of smoke-flues and dampers, by which great loss is incurred by incomplete combustion; fifth, needless complication and consequently needless expense in construction.

The nature of my invention consists in the construction of a wrought-iron hot-air stove or furnace, surrounded by metallic flanges, in such a manner as will compel and force the circulating air into close contact with the body

of such stove or furnace, thereby preventing the gathering of noxious gases which ordinarily pass through furnaces or fire-pots constructed of cast-iron.

Figure 1 shows a plan and interior view of my device, one-half of the external covering being removed. Fig. 2 shows the fire-pot lined with fire-brick.

A is the pipe through which cold air enters the furnace; B, the ash-chamber and grate; C, the ash-pit door; D, the external covering of galvanized iron; I, the series of annular metallic rings placed around the heat-radiating dome H, to bring the air to every part of its surface; F, the feeding-orifice; E E, the places of exit for the heated air; G, the smoke-flue, and J the ring by which the air-chamber is attached to the base.

The fire-pot, Fig. 2, is made of wrought or malleable iron, firmly bolted together, and lined with fire-brick, and is placed upon the base of the furnace, over the ash-chamber and grate. The dome H is also constructed of wrought or malleable iron, riveted together in the form shown in Fig. 1, having formed upon it or fitting over the flanged ring J, and firmly riveted to it, the dome passing over the fire-pot and in close contact with it, the whole being surrounded with the galvanized-iron outside covering, D, forming the air-chamber.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In the construction of hot-air stoves or furnaces composed of wrought or malleable iron, constituting the heat-radiating surface, the adjustment and application to the body thereof of flanges, in the manner and for the purpose herein described.

2. The heat-radiating device H, in combination with the flanges I I and covering D, in the manner and for the purpose herein described.

JAMES R. NICHOLS.

Witnesses:

CHAS. E. BILLINGS,  
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