2 Sheets--Sheet 1.

N. A. BOYNTON.

Hot-Air Furnaces.

No. 156,759. Patented Nov. 10, 1874.

Fig. 1.

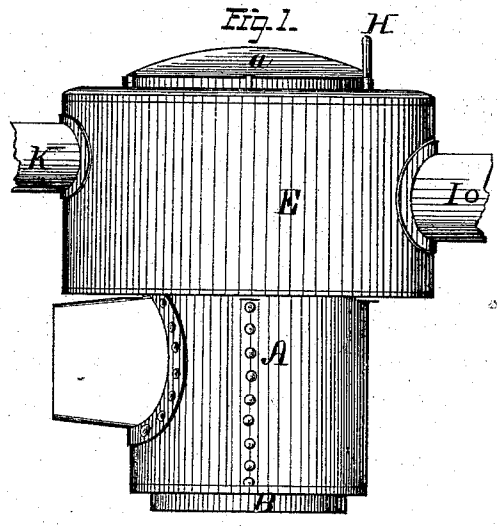


Fig. 2.

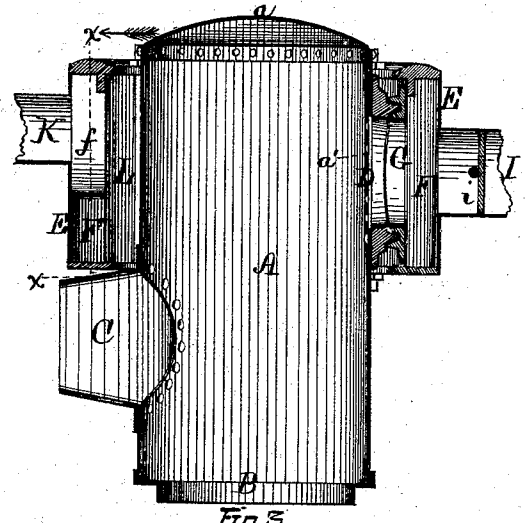
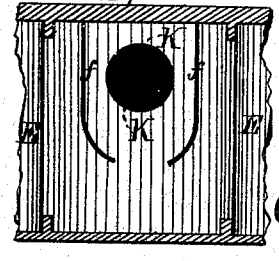


Fig. 3.



WITNESSES=

Jas E Hutchinson

John R Young

INVENTOR.

N. A. Boynton, by

Prindle and Deane, his attys

2 Sheets--Sheet 2.

N. A. BOYNTON.

Hot-Air Furnaces.

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Fig. 4.

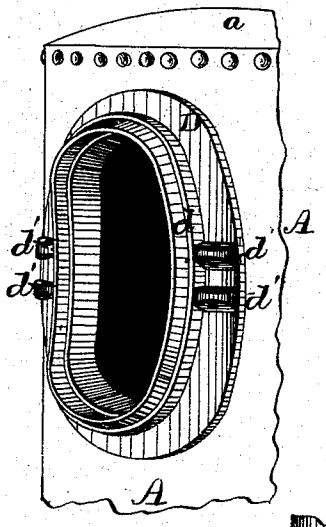


Fig. 5.

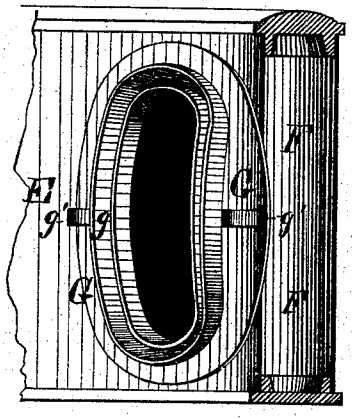


Fig. 6.

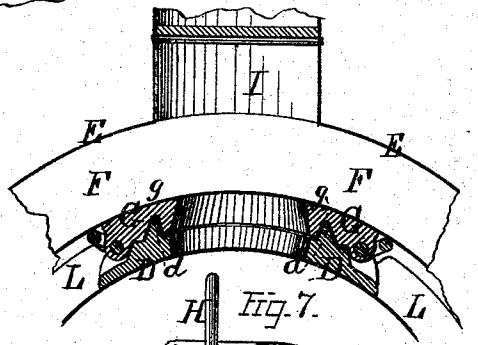
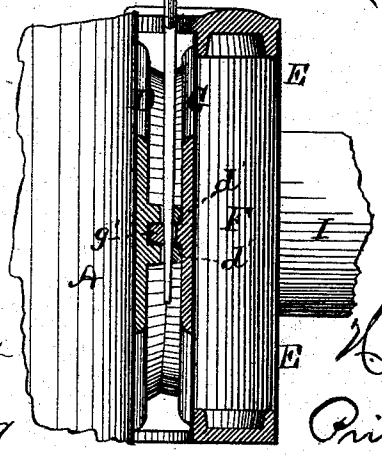


Fig. 7.



WITNESSES:

Jas. E. Hutchinson

John R. Young

INVENTOR.

N. A. Boynton, by Prindle and Deane, his attorneys

UNITED STATES PATENT OFFICE.

NATHANIEL A. BOYNTON, OF NEW YORK, N. Y.

IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. **156,759**, dated November 10, 1874; application filed July 11, 1874.

To all whom it may concern:

Be it known that I, NATHANIEL A. BOYNTON, of New York city, in the county of New York and in the State of New York, have invented certain new and useful Improvements in Furnaces; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side elevation of my improved furnace, with the exterior portions and casing removed. Fig. 2 is a vertical central section of the same, upon a line passing from front to rear. Fig. 3 is a vertical section of the central portion of the front side of the radiator, upon line *x x* of Fig. 2. Figs. 4 and 5 are perspective views of the inner or engaging faces of the collars employed for connecting the body and radiator. Fig. 6 is a horizontal section of said collars, as combined, and of the contiguous portions of the body and radiator; and Fig. 7 is a vertical section of said parts, upon a line extending through the centers of the locking lugs or ears upon one side.

Letters of like name and kind refer to like parts in each of the figures.

The design of my invention is to increase the efficiency and perfectness of operation of a hot-air furnace; and it consists, principally, in the means employed for locking together the collars which form the connection between the body and radiator, substantially as and for the purpose hereinafter specified. It consists, further, in the flue-strips arranged within the radiator at each side of the exit-flue, for the purpose of keeping the heated gases at a low point within the radiator, substantially as is hereinafter shown.

In the annexed drawings, A represents the body of my heater, constructed, preferably, in the form of a straight cylinder, the upper end of which is permanently inclosed by means of a head, *a*, while its lower end (which forms the fuel-chamber) is provided with a frame, B, for the support of a grate. At its front side, at a suitable point above the grate, the body A is provided with a feed-chute, C, of usual construction, while at its rear side, and near its upper end, is secured a collar, D, which surrounds an opening, *a'*, provided for the outward passage of the heated escaping products of combustion. Around the upper portion of the body A is placed a radiator, E, which has an annular form horizontally, is constructed with double walls in the usual manner, and has such horizonal dimensions as to cause the space between its inner wall and the exterior of said body to substantially equal, in radial dimensions, the flue or space F within said radiator. Upon the inner side of the radiator E is secured a collar, G, which corresponds in size and shape to the like features of the collar D, and is provided, within its face, with a groove, *g*, that corresponds to and receives the flange *d*, which projects from said collar D. Upon each side of the collar G, at its vertical center, is provided a lug or ear, *g'*, which lug, when said collar is combined with the collar D, passes between two similar lugs, *d'* and *d'*, that are secured to and extend outward from the latter, and each of said lugs being provided with a suitable vertical opening, a rod, H, is passed through the same and locks said parts securely in position.

In order that the collars D and G may be pressed firmly together, so as to form a close joint between their engaging surfaces, the openings in the lugs *d'* and *g'* are formed, respectively, slightly inside and outside of their common centers, so that the rod H (which is made tapering at its lower end) may be caused to bear against the outer sides of the openings in said lugs *d'*, and the inner sides of the lugs *g'*, as shown in Fig. 7, so that, when driven downward, said rod will draw said lugs and their collars together. While a slight downward movement of the rods will draw the collars as firmly together as may be necessary, said rods are easily loosened and withdrawn whenever it becomes necessary to disconnect the body and radiator.

The direct-draft exit-pipe I is located directly in rear of the collar G of the radiator E; but, for the purpose of rendering available the radiating-surface of the latter, a second exit-pipe, K, is provided at the front side of the same, and a damper, *i*, placed within said pipe I, so as to compel the heated escaping gases to pass through said radiator and out of said pipe K. The pipe K is placed near

the upper end of the radiator E, and upon each side of the same, within the flue F, is placed a flue-strip, *f*, which closes said flue from its upper side downward below its vertical center. This arrangement of the flue-strips causes the heated gases to pass downward to the lower side of the radiator before escaping into and through the exit-flue, and thereby largely increases the effective heating capacity of said radiator.

It will be seen that, as combined, a clear space, L, is left between the radiator and body at all points, except where the collars are situated, and that, if the air is permitted to circulate freely through such space, a large percentage of the heat radiated from said parts will be made available, the heating capacity of the furnace being thus largely increased.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

1. In a heating-furnace having a central body, A, and surrounding radiator E, the collars D and G, provided, respectively, with the perforated lugs *d d* and *g' g'*, and the tapering rods H and H, passing through said lugs, said parts being combined to form an air-tight connection between said body and radiator, substantially as specified.

2. The flue-strips *f* and *f*, located within the flue F of the radiator E, upon opposite sides of the exit-pipe K, in combination with said parts, substantially as and for the purpose shown.

In testimony that I claim the foregoing I have hereunto set my hand this 8th day of May, 1874.

NATHANIEL A. BOYNTON.

Witnesses:
WORTHINGTON GREGORY,
JAMES B. TAYLOR.