

T. J. WALTON.
HOLLOW METAL FURNACE GRATE.
APPLICATION FILED APR. 1, 1909.

964,344.

Patented July 12, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

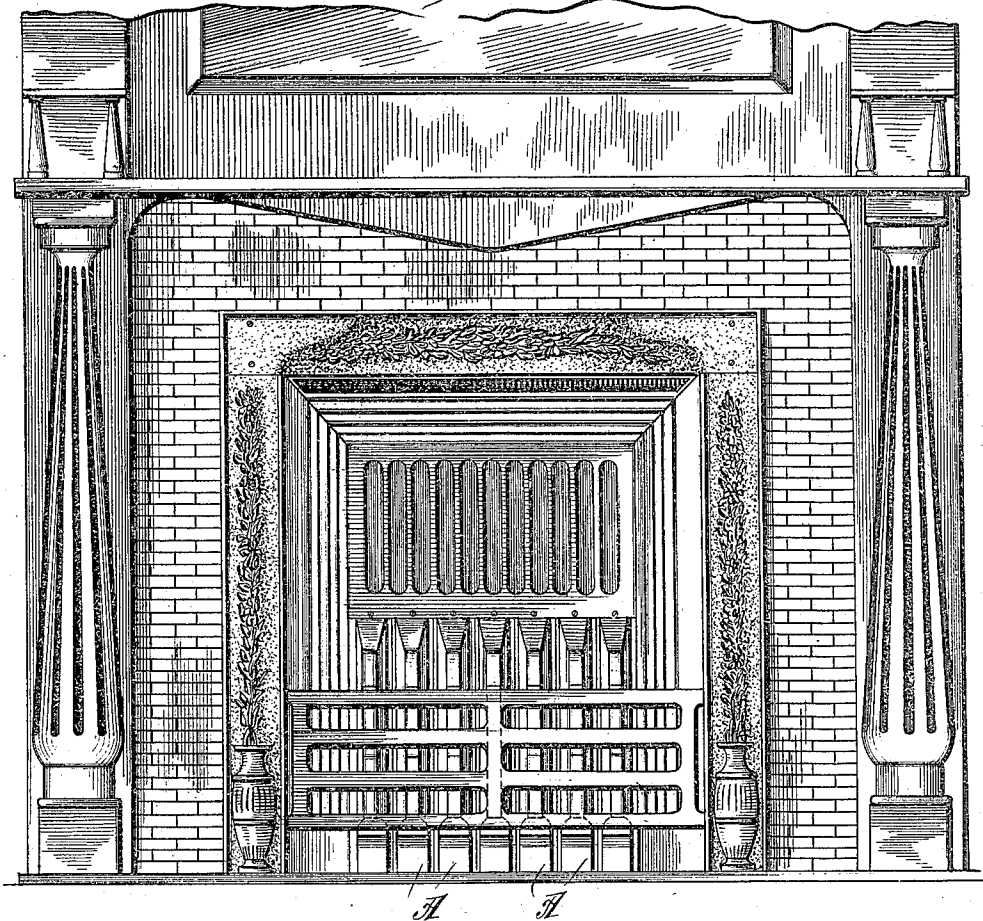
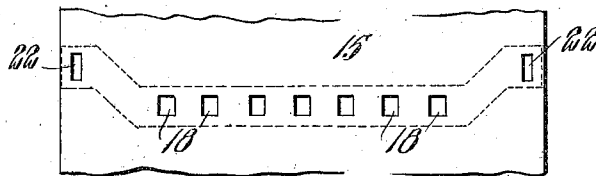


Fig. 2.



WITNESSES
E. M. Callaghan
L. A. Stanley

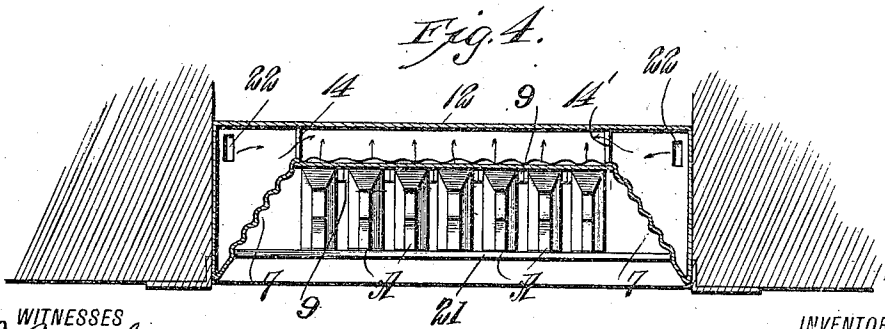
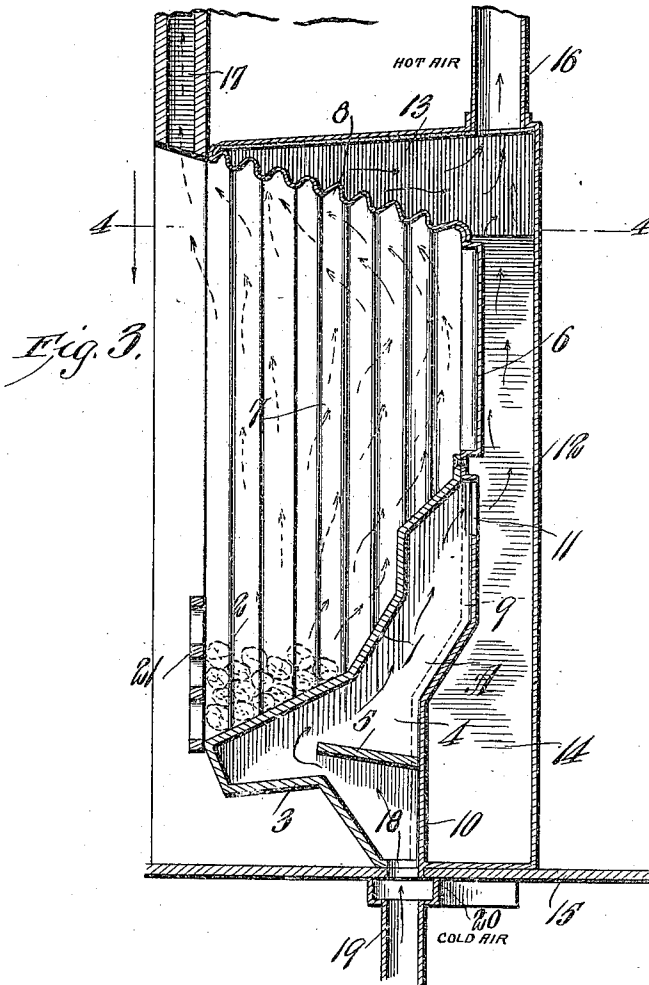
INVENTOR
THOMAS J. WALTON
BY *Munroe*
ATTORNEYS

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THOMAS J. WALTON
BY *Munn & Co.*
ATTORNEYS

UNITED STATES PATENT OFFICE.

THOMAS JOHNSTON WALTON, OF SPRINGFIELD, TENNESSEE.

HOLLOW METAL FURNACE-GRATE.

964,344.

Specification of Letters Patent. Patented July 12, 1910.

Application filed April 1, 1909. Serial No. 487,205.

To all whom it may concern:

Be it known that I, THOMAS JOHNSTON WALTON, a citizen of the United States, and a resident of Springfield, in the county of Robertson and State of Tennessee, have made certain new and useful Improvements in Hollow Metal Furnace-Grates, of which the following is a specification.

My invention relates to improvements in grates, and it consists in the constructions, combinations and arrangements herein described and claimed.

An object of my invention is to provide a grate of metal which can be connected up with registers and pipes leading to adjoining rooms, so that the latter may be heated by means of air to which heat has been imparted in coming in contact with the top, back, sides and bars of the grate, on the opposite side from the fire.

A further object of my invention is to provide a grate having sides, a top and a back of peculiar construction so as to absorb a maximum quantity of heat, and to give out the same to the air coming in contact with their opposite surfaces.

Other objects and advantages will appear in the following specification and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings in which—

Figure 1 shows a front view of my improved grate. Fig. 2 is a view showing the air inlets. Fig. 3 is an enlarged central vertical section from front to rear, and Fig. 4 is a horizontal section along the line 4—4 of Fig. 3, looking in the direction of the arrow.

In carrying out my invention I provide a series of hollow grate bars A, of a form clearly shown in Fig. 3. It will be noted that these grate bars have an upper surface 1 of a zig-zag shape clearly shown in the figure. The lower part of this surface 1 forms a support for the fuel 2, while the upper part forms part of the back of the grate. The bottom 3, of the grate bar has an approximately horizontal portion, and an inclined portion, as shown in the figure, extending rearwardly. The sides 4 of the grate bars slope from the front to the rear as shown in Fig. 1, and between the opposite sides of each grate bar is a baffle plate 5.

Above the grate bars and suitably connected to them at their tops is the back 6.

This consists of a corrugated sheet of metal, the corrugations being for the purpose of providing a greater heating surface, and therefore increasing the capacity for transmitting heat to the air. The jambs or side pieces 7 are constructed of similar corrugated pieces and incline inwardly from the sides as clearly shown in Fig. 4. The top 8 is likewise corrugated.

The grate bars are secured in position and their laterally extending side flanges 9 abut the corresponding side flanges of the adjacent grate bars and jambs. The rear open side of the hollow grate bar is closed by means of a wall 10, which extends from the bottom of the grate bar nearly to the top. An opening 11 however is left between the top of the grate bar and the upper edge of the upper top to provide outlet means for the heated air.

In the rear of the grate bars and the back 6 is a wall 12, and at the upper end of the wall 12, is a top 13, which extends from the wall 12, forwardly to the upwardly inclined member 8, as shown in Fig. 3. Two side partitions 14 and 14' extend from the base 15 to the lower end of the inclined top 8. This provides an opening into the common air chamber above the top. The pipe 16 communicates with the common air space at the top of the grate and is designed to convey the heated air into adjacent rooms for the heating of the latter. In Fig. 3 I have shown an exit flue 17, as located at the forward edge of the grate, but it will be understood that this exit flue might be located at a point farther back and that a damper might be provided for permitting products of combustion to escape directly into the flue.

The grate bars are arranged side by side as already explained and the bottoms thereof are arranged to register with the inlet openings 18 in the floor 15. In practice, the air would be conducted by a pipe 19 into a common air chamber 20 beneath the floor and there distributed through the openings 18, or the air may be drawn directly from the cellar or basement, or from the rooms to be heated by warm air, through the openings 18.

From the foregoing description of the various parts of the device the operation thereof may be understood. The grate is assembled in the manner explained, and the fuel is laid on top of the bars, being held in

place by the front 21. When the fire is started the grate bars being surrounded by the fuel become intensely heated and impart this heat to the air which comes in from the bottom. The baffle plate 5 which is located within each hollow grate bar directs the incoming stream of air against the highly heated surface of the grate bar in the manner indicated in Fig. 3. The air then passes through the upper part of the grate bar through the opening 11 into the air space in the rear of the back 6. As the air continues up it is brought into contact with the corrugated back and is still further heated, from thence it passes directly into the hot air pipe 16, and into the room which is to be heated.

In order to utilize the heat of the sides or jambs of the grate, I provide the openings 22 for cold air, the air entering through these openings passes upwardly into contact with the sides 7, being confined by the partitions 14, and 14'. The sides being corrugated and presenting a larger heating surface tend to heat the air which then passes up above the partitions 14 and 14' and joins with the heated air from grate bars in the common chamber. It will also be noted that the bottom of the common heating chamber is formed by the top 8 of the grate proper, which is also corrugated to provide a larger heating surface.

It will thus be seen that I have provided a grate which is capable of heating the room in which it is located, and also acting as a hot air furnace for the heating of other rooms or apartments to which the air pipes lead. Not only do I obtain the maximum heating capacity by bringing the air to be heated in direct contact with the hottest parts of the grate, namely, the grate bars, but I also increase the efficiency by

providing an extended heating surface on the sides and top and back of the grate.

I claim—

1. In a grate, a series of hollow grate bars, each being provided with an opening in its bottom, and having a forwardly and downwardly inclined bearing surface, a baffle plate disposed within the hollow of each grate bar, and arranged to force air against said bearing surface, a corrugated back secured to the tops of said grate bars, a wall in the rear of said back and spaced therefrom, said grate bars being provided with an opening at the top communicating with the space between the corrugated back and the rear wall, means for admitting air through the bottom openings of said grate bars, and means for conveying away the hot air from the space between the rear wall and the corrugated back.

2. In a grate, a series of hollow grate bars, open at their rear sides and provided with downwardly and forwardly inclined front portions, upwardly-extending rear portions, a common partition secured to each of said grate bars at the rear side thereof, and arranged to provide openings at the bottoms and the tops of the grate bars, a corrugated back secured to said grate bars at the tops thereof, corrugated sides, a corrugated top, rear, side, and top walls spaced respectively from the rear, side, and top corrugated members, the openings at the tops of said grate bars communicating with the space between said corrugated back and said rear wall, and a hot air pipe having communication with the said rear and top spaces for conveying away the heated air.

THOMAS JOHNSTON WALTON.

Witnesses:

FRANK BEEL,

JOHN EWING GARNER.