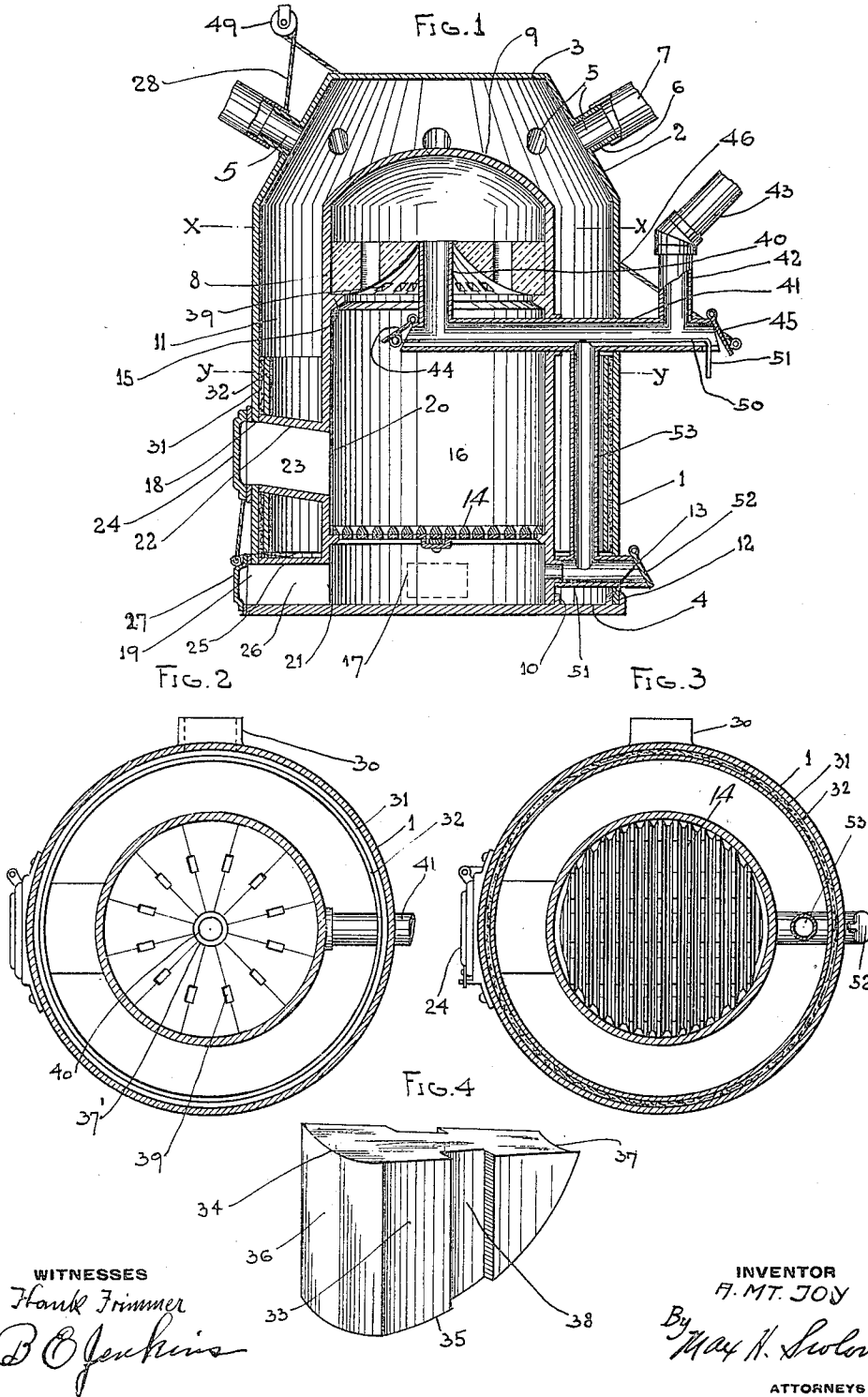


A. MT. JOY.
FURNACE.

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WITNESSES
Hank Frimmer
D. B. Jenkins

INVENTOR
A. MT. JOY
By May H. Solovitz
ATTORNEYS

UNITED STATES PATENT OFFICE.

ALBERT MT. JOY, OF GREENSBURG, PENNSYLVANIA.

FURNACE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALBERT MT. JOY, a citizen of the United States, residing at Greensburg, in the county of Westmoreland and State of Pennsylvania, have invented certain new and useful Improvements in Furnaces, of which the following is a specification.

This invention relates to furnaces, and more particularly to that type of furnaces commonly styled a hot air heater and has for its object to provide a furnace with means, in a manner as hereinafter set forth, for consuming smoke as it passes from the fire box under such conditions as to provide for an increase of heat with a minimum amount of coal.

A further object of the invention is to provide a furnace, of the class referred to, with a heat retaining element to assist in increasing the temperature of the air, the said heat retainer being arranged near the top of the furnace and under such conditions overcoming the decreasing of the temperature of the air while the latter is being discharged from the furnace.

A further object of the invention is to provide a furnace, of a type referred to, with means in a manner as hereinafter set forth, which is simple in its construction and arrangement, strong, durable, efficient and convenient in its use, readily set up and comparatively inexpensive.

With the foregoing and other objects in view the invention consists of the novel construction, combination and arrangement of parts as hereinafter more specifically described and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:—Figure 1 is a vertical sectional view of a furnace in accordance with this invention. Fig. 2 is a section on line X—X, Fig. 1. Fig. 3 is a section on line Y—Y, Fig. 1. Fig. 4 is a perspective view of one of the sections of the heat retainer.

Referring to the drawings in detail 1 denotes a casing, having a conical upper portion 2 and a closed top 3.

The reference character 4 denotes the bottom of the furnace.

The conical upper portion 2 of the casing 1 is provided with a series of outlets 5, with which communicate nipples 6, the latter having connected thereto diverging flues for conducting the hot air to various points.

Arranged within the casing 1 is a vertically disposed shell 8 having a dome-shaped top 9 and said shell at its lower end is closed by the bottom 4 of the casing 1. The dome 9 extends into the conical upper portion 2 of the casing 1. The bottom 4 has a vertically disposed annular flange 10 which surrounds the lower portion of the shell 8 whereby the latter is maintained in spaced relation with respect to the casing 1. The diameter of the shell 8 with respect to the casing 1 is such to provide an air chamber 11.

The bottom 4 has a pair of spaced flanges 12, 13, which are arranged concentric with respect to each other and through which is positioned the lower end of the casing 1.

Arranged within the shell 8 is a grate 14 and formed integral with the inner face of the shell 8 and arranged above the grate 14 is an inwardly extending annular flange 15 and that portion of the shell 8 between the grate 14 and flange 15 constitutes a fire box 16. The grate 14 is arranged above the lower end of the shell 8 and that portion of said shell 8 below the grate 14 provides an ash pit 17.

The casing 1 has an opening 18 and below the latter an opening 19. The shell 8 has an opening 20 and below the latter an opening 21. Leading from the opening 18 to the opening 20 is a rectangular member 22, the latter extending across the air chamber 11 and providing a channel 23 to enable fuel to be supplied to the fire box 16. The opening 18 is closed by a door 24 which is hinged to the casing 1. Leading from the opening 19 to the opening 21 is a rectangular member 25 which provides a channel 26 whereby access can be had to the ash pit 17. The opening 19 is closed by a hinged door 27 controlled by a flexible member 28. The air chamber 11 has an intake 30 which opens there into at the bottom thereof.

The casing 1 has its inner face lined with asbestos as at 31, the latter being main-

tained in position by a plate 32. The lining 31 and plate 32 is of less height than the height of the fire box 16 and extends slightly below the grate 14 and is designed to protect the casing 1 from the heat given off from the fuel within the fire box 16.

Mounted upon the flange 15 is a heat retainer, constructed of any suitable material capable of being brought to incandescence. The heat retainer is circular in plan and is formed of a series of abutting tapering members, that is to say tapering from the inner toward their outer end and each of said members gradually decreases in height from their outer toward their inner end. Each of said members is indicated at 33, and has a flat top 34 and curvilinear bottom 35, the curvature of the bottom 35 being upwardly and inwardly. Each of said members 33 has its outer end 36 curved so as to conform to the curvature of the shell 8, the latter being cylindrical in contour. Each of said members has its inner end curved as at 37 whereby when the members are mounted in position a vertically disposed cylindrical opening 37¹ will be provided. Each of the members has each of its sides, intermediate its outer and inner end, formed with a vertically disposed rectangular groove 38, whereby when the members 33 are mounted in abutting engagement a series of vertically disposed channels 39 are provided, which at their lower ends open into the fire box 16 and at their upper ends open into the dome 9. The channels 39 are provided for the passage of smoke from the fire box 16 into the dome 9 and owing to the temperature of the heat retainer the heat giving-off units of the smoke will be consumed under such conditions as will prevent waste and such heat retainer sets up what may be termed a smoke consumer element.

Secured in the opening 37' and flush with the upper face of the heat retainer is a vertically disposed pipe 40, which is open at its upper end, and has its lower end communicating with a right angularly disposed discharge pipe 41, the latter opening into a branch 42, which is connected with the stack, not shown, by a pipe 43. The discharge pipe 41, at its inner end is closed by a damper 44 and at its outer end by a damper 45, the latter being connected to a flexible member 46, which is attached to the flexible member 28, and the said members 46 and 28 are associated with the pulley 49 which is employed for regulating the draft. The controlling element 49 may be positioned at any point desired and when operated in one direction will open the door 27 and close the damper 45 and by employing the members 28, 46 and element 49 the draft can be controlled as is obvious.

The damper 44 is actuated by a rod 50

which has a right angularly disposed end 51 depending down through the outer end of the pipe 41 and exterior of the casing 1. The damper 44 normally closes the inner end of the pipe 41, but if it be desired to increase the draft, due to atmospheric influences, the damper 44 is opened which will increase the draft, as is obvious.

The furnace is provided with what may be termed a clean-out pipe 52 which communicates with the ash pit 17 and projects outwardly from the casing 1 and is closed at its outer end by a door. Depending from the discharge pipe 41 and arranged within the air chamber 11 is a pipe 53 whereby any foreign substances within the pipe 41 can be discharged down through the pipe 43 into the pipe 52 and then removed when the door carried by the pipe 52 is opened.

The grate 14 may be of any suitable construction and provided with any convenient shaking down means.

What I claim is:—

1. A hot air furnace comprising a casing having leading off flues at the top thereof, a closed shell within and providing in connection with said casing a hot air chamber, means connecting with said shell to provide a fire box, a smoke consuming element arranged within said shell and provided with means for the passage of smoke from the fire box to the upper portion of the shell, means extending downwardly from said smoke consuming element for conducting the smoke toward the fire box, and a discharge pipe connected with said means and leading to a stack.

2. A hot air furnace comprising a casing having leading off flues at the top thereof, a closed shell within and providing in connection with said casing a hot air chamber, means in connection with said shell to provide a fire box, a smoke consuming element arranged within said shell and provided with means for the passage of smoke from the fire box to the upper portion of the shell, means extending downwardly from said smoke consuming element for conducting the smoke toward the fire box, a discharge pipe connected with said means and leading to a stack, and a draft regulating means connected with said casing and discharge pipe.

3. A hot air furnace comprising a casing having leading off flues at the top thereof, a closed shell within and providing in connection with said casing a hot air chamber, means in connection with said shell to provide a fire box, a smoke consuming element arranged within said shell and provided with means for the passage of smoke from the fire box to the upper portion of the shell, means extending downwardly from said smoke consuming element for conducting the smoke toward the fire box, a discharge

pipe connected with said means and leading to a stack, and a lining arranged against the inner face of said casing near the lower portion thereof.

5 4. A hot air furnace comprising a casing having leading off flues at the top thereof, a closed shell within and providing in connection with said casing a hot air chamber, means in connection with said shell to provide a fire box, a smoke consuming element
10 arranged within said shell and provided with means for the passage of smoke from the fire box to the upper portion of the shell, means extending downwardly from said
15 smoke consuming element for conducting the smoke toward the fire box, a discharge pipe connected with said means and leading to a stack, a draft regulating means connected with said casing and discharge pipe,
20 and a lining arranged against the inner face of said casing near the lower portion thereof.

5 5. A furnace comprising a casing having hot air conducting flues leading off from the top thereof, a shell arranged in said casing and providing in connection therewith a hot air chamber, means within said shell to provide a fire box and an ash pit, means whereby fuel can be supplied to the
30 fire box, means whereby access can be had to the ash pit, a combined heat retainer and smoke consuming element arranged within said shell at the top of the fire box and capable of being heated to incandescence
35 and further provided with vertically disposed flues for the passage of smoke, means connected with said element for conducting smoke downwardly from the upper portion of said shell, and toward said fire box, and
40 a discharge pipe connected with the lower end of said means and leading to a stack.

6. A furnace comprising a casing having hot air conducting flues leading off from the top thereof, a shell arranged within
45 said casing and providing in connection therewith a hot air chamber, means within said shell to provide a fire box and an ash pit, means whereby fuel can be supplied to a fire box, means whereby access can be
50 had to the ash pit, a combined heat retainer and smoke consuming element arranged within said shell at the top of the fire box and capable of being heated to incandescence and further provided with vertically
55 disposed flues for the passage of smoke, means connected with said element for conducting smoke downwardly from the upper portion of said shell and toward said fire box, a discharge pipe connected
60 with the lower end of said means and leading to a stack, and a clean-out element for said discharge pipe.

7. A furnace comprising a casing having hot air conducting flues leading off from
65 the top thereof, a shell arranged in said

casing and providing in connection therewith a hot air chamber, means within said shell to provide a fire box and an ash pit, means whereby fuel can be supplied to the fire box, means whereby access can be had
70 to the ash pit, a combined heat retainer and smoke consuming element arranged within said shell at the top of the fire box and capable of being heated to incandescence and further provided with vertically disposed
75 flues for the passage of smoke, means connected with said element for conducting smoke downwardly from the upper portion of said shell, and toward said fire box, a discharge pipe connected with the lower end
80 of said means and leading to a stack, and draft regulating means associated with said ash pit and discharge pipe.

8. A furnace comprising a casing having hot air conducting flues leading off from
85 the top thereof, a shell arranged in said casing and providing in connection therewith a hot air chamber, means within said shell to provide a fire box and an ash pit, means whereby fuel can be supplied to the
90 fire box, means whereby access can be had to the ash pit, a combined heat retainer and smoke consuming element arranged within said shell at the top of the fire box and capable of being heated to incandescence
95 and further provided with vertically disposed flues for the passage of smoke, means connected with said element for conducting smoke downwardly from the upper portion of said shell, and toward said fire box, a
100 discharge pipe connected with the lower end of said means and leading to a stack, and a lining for the inner face of said shell at the lower portion thereof.

9. A furnace comprising a fire box, a
105 combined heat retaining and smoke consuming element arranged above said fire box and provided with flues for the passage of smoke, and means connected to said element for conducting the smoke from above said
110 element down toward the fire box and then in a direction at right angles to the fire box, said means leading to a stack.

10. A furnace comprising a fire box, a
115 combined heat retaining and smoke consuming element arranged above said fire box and provided with flues for the passage of smoke, and means connected to said element for conducting the smoke from above said element down toward the fire box and
120 then in a direction at right angles to the fire box, said means leading to a stack, and said element consisting of a series of tapering sections, having alining grooves and each constructed of material capable of
125 being heated to incandescence.

11. A furnace comprising a fire box, a combined heat retaining and smoke consuming element arranged above said fire box and provided with flues for the passage of
130

smoke, and means connected to said element
for conducting the smoke from above said
element down toward the fire box and then
in a direction at right angles to the fire
5 box, said means leading to a stack, and said
element consisting of a series of tapering
sections having alining grooves and each
constructed of material capable of being
heated to incandescence, and each of said

sections having its bottom curving up- 10
wardly and inwardly.

In testimony whereof I affix my signature
in presence of two witnesses.

ALBERT MT. JOY.

Witnesses:

B. E. JENKINS,

J. F. SEKENHUGER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."