

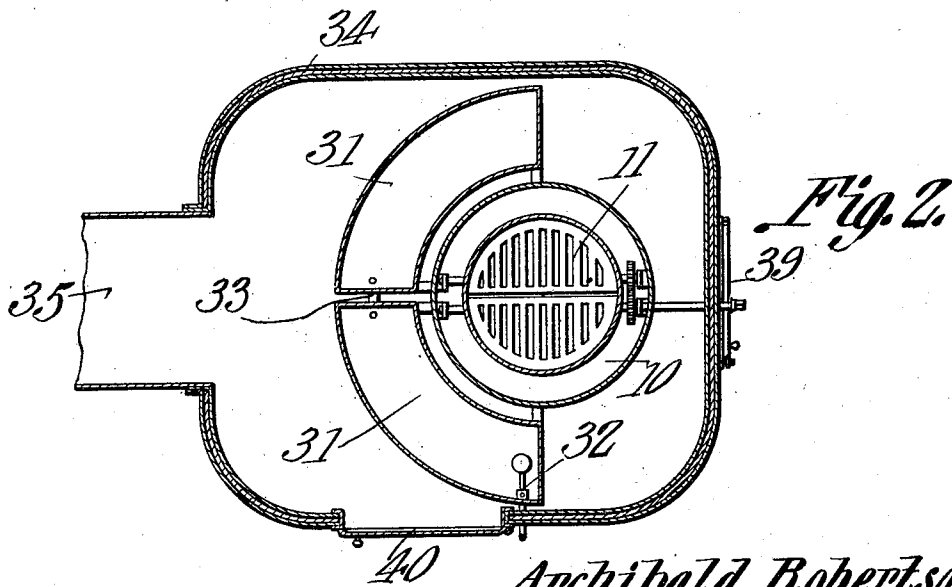
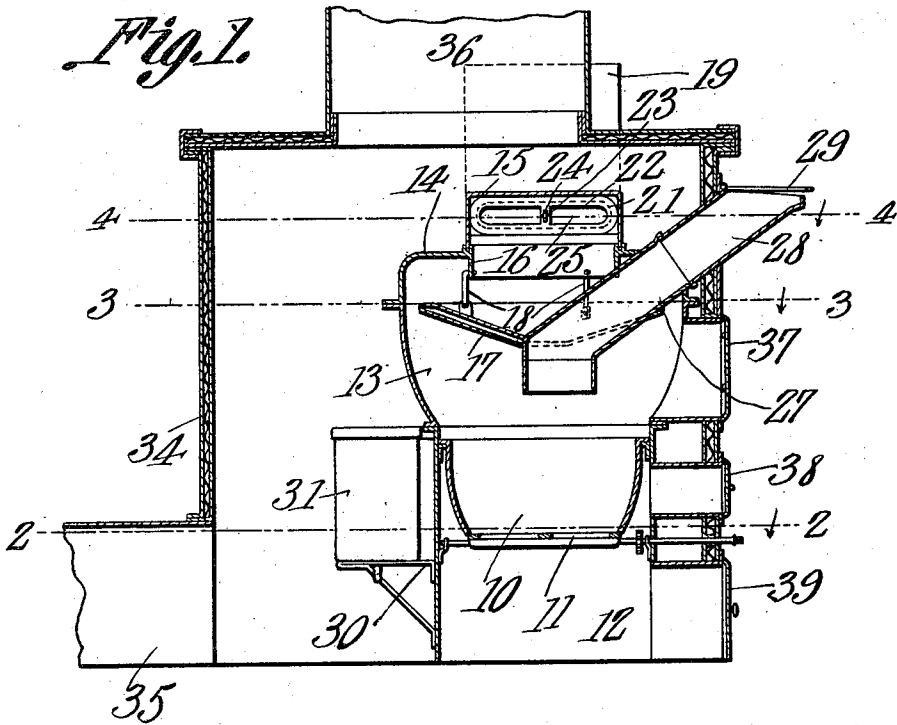
A. ROBERTSON.
FURNACE.

APPLICATION FILED JUNE 2, 1910.

Patented Jan. 16, 1912.

2 SHEETS-SHEET 1.

1,014,724.



Witnesses

J. P. ...
M. ...

Archibald Robertson,
Inventor

by

C. A. Snow & Co.
Attorneys

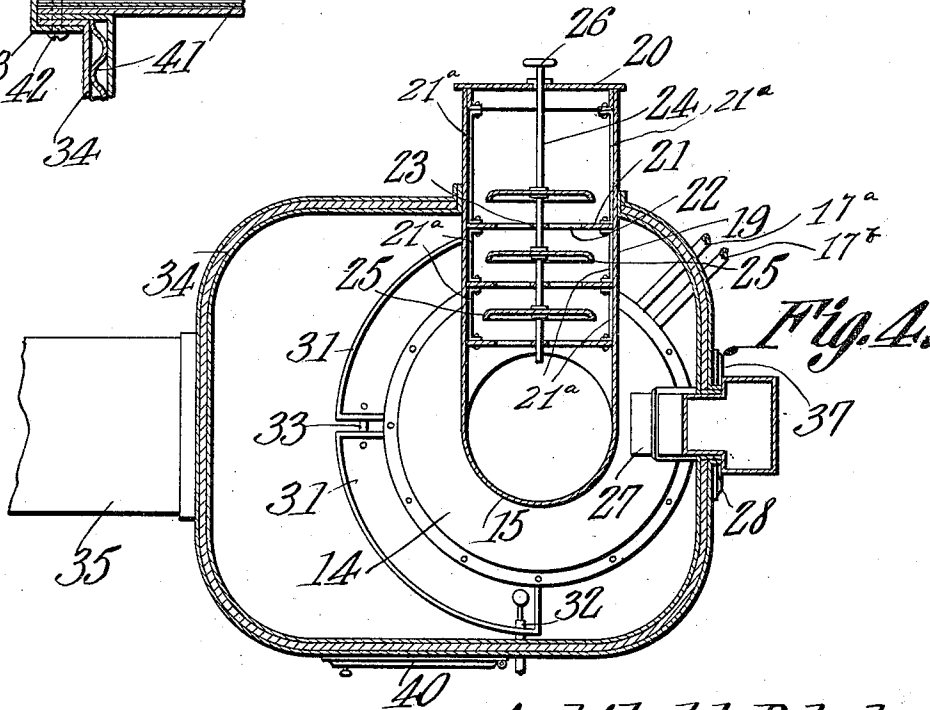
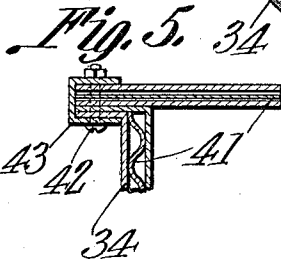
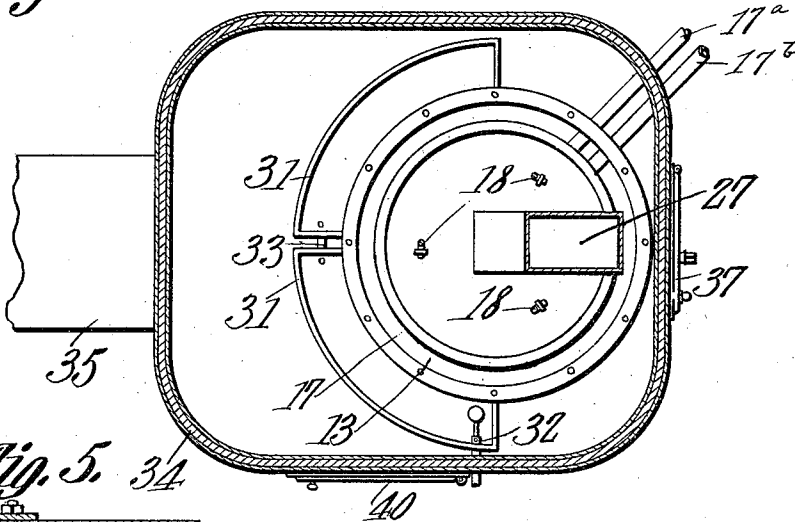
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Fig. 3.



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UNITED STATES PATENT OFFICE.

ARCHIBALD ROBERTSON, OF DULUTH, MINNESOTA.

FURNACE.

1,014,724.

Specification of Letters Patent.

Patented Jan. 16, 1912.

Application filed June 2, 1910. Serial No. 564,655.

To all whom it may concern:

Be it known that I, ARCHIBALD ROBERTSON, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented a new and useful Furnace, of which the following is a specification.

This invention has for its object to provide in a hot air furnace a structure whereby a maximum heat radiating surface is obtained and also to provide a furnace which is simple in construction, and economical in its consumption of fuel.

The invention also has for its object to provide an improved damper structure for controlling the escape of the products of combustion.

With these objects in view, the invention consists in a novel construction and arrangement of parts to be hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a central vertical section of a furnace embodying the present invention. Figs. 2, 3 and 4 are horizontal sections on the lines 2—2, 3—3, and 4—4 respectively of Fig. 1. Fig. 5 is a sectional detail showing the construction of the outer shell or casing of the furnace.

In the drawing, 10 denotes a fire pot which is provided with a grate 11. Below the grate is located an ash pit 12. Above the fire pot is arranged a combustion chamber 13, said chamber being in open communication with the fire pot. The combustion chamber is closed on top by a cover 14 having a central opening from which rises a dome 15. The products of combustion pass into this dome, and escape through a flue connected thereto. This flue will be presently described. From the opening in the top 14 of the combustion chamber 13 depends a skirting 16, said skirting surrounding the opening, and its function being to deflect the products of combustion as will be presently described. This skirting supports a baffle plate 17 which is located below the same within the combustion chamber. The baffle plate is of substantially inverted frusto-conical form, and it extends at its outer edge in close proximity to the wall of the combustion chamber, whereby the heat is deflected against said wall. The baffle plate is suspended from the skirting 16 by suitable hangers 18. Inasmuch as this baffle plate is located beneath the outlet opening,

it will be evident that the products of combustion are deflected laterally against the wall of the combustion chamber near its upper end, and against the top thereof, after which they are deflected downwardly by the skirting 16, and pass under the same, and thence upwardly into the dome 15. The products of combustion upon striking the skirting 16 are thrown back against the top 14 before passing downwardly and making their escape into the dome. This arrangement gives the greatest amount of shell radiation where the heat is at its greatest intensity. The baffle plate 17 is cast hollow so as to serve as a water heater, the intake and outlet pipes 17^a and 17^b, respectively extending through the shell of the furnace to one side of the feed door.

At 19 is indicated the flue which carries off the products of combustion, said flue being connected to and entering the dome 15 on one side. The flue may be connected to the dome at any convenient point, and it passes through the inclosing shell or casing of the furnace, on the outside of which connection is made with a smoke pipe. The outer end of the flue is closed by a removable cover 20. Within the flue is located a plurality of transverse partitions 21 having each a central opening 22 across which extends a web 23. These webs support a rod 24 carrying dampers 25, and extending through the cap 20, the outer end of said rod being fitted with a suitable handle 26. The rod 24 is slidably mounted, and the dampers 25 are located on one side of the openings 22, so that upon operating said rod, the dampers may be adjusted to close the openings more or less, and thus control the passage of the products of combustion through the flue 19. The arrangement of the partitions 21, and the dampers 25 provide a tortuous path for the products of combustion, said products upon passing through one of the openings 22 striking the damper behind the same, and being thereby deflected laterally. The products then pass around the damper, and pass through the opening in the next partition, and upon striking the next damper they are again deflected laterally, and so on throughout the entire series. This tortuous path taken by the products of combustion prevents the heat from being wasted which would be the case if said products were led directly into the smoke pipe. The partitions 21 are con-

ected by rods 21^a to the cover so that the entire damper structure may be removed from the flue 19 for cleaning purposes.

The combustion chamber 13 is entered by
5 a fuel magazine 27 extending through the top thereof, and passing through an opening in the plate 17. To the upper end of this magazine is connected a chute 28 which extends through the outer shell or casing of
10 the furnace, and is provided on the outside thereof with a suitable closure 29. The magazine is supplied through this chute. The magazine and the chute are inclined, and are therefore self-feeding, and by feed-
15 ing through the chute 28, the fuel can be always kept alive, the gas being consumed as the fuel drops.

On the outside of the fire pot 10 is a shelf
30 which supports water tanks 31 which may be kept full of water by a suitable float valve 32. A pipe 33 connects the tanks so that a single float valve will operate to fill both tanks. The tanks partly surround the fire pot as shown in Fig. 2.

25 At 34 is indicated the shell or inclosing casing of the furnace, said shell having a fresh air inlet 35 at the bottom, and an outlet 36 at the top, the hot air escaping from said outlet, and being carried by suitable
30 flues to the various rooms or other places to be heated. The casing has a door 37 located over an opening in the combustion chamber 13, and also a door 38 through which access may be had to the fire pot 10, as well an
35 ash pit door 39, and a man-hole door 40 on the side. The casing 34 is made of two thicknesses of sheet metal with a layer of corrugated asbestos insulating paper there-

between, said layer being indicated at 41. By thus insulating the casing of the fur-
40 nace, the heat is prevented from being wasted by radiation, and it is held in the casing, and made humid therein by evaporation of the water in the tanks 31. The heated and moistened air passes out of the
45 casing through the outlet 36 and is then conducted to the various rooms or other places to be heated. The joint between the top and side walls of the casing is made by bending the upper ends of the side walls outwardly
50 to form a horizontal flange, and bolting the top to said flange as indicated at 42. A channel shaped strip 43 is placed over the edges of the flange and the top, through the flanges of which strip the bolts 42 pass. 55

What is claimed is:

In a furnace, a fire pot, a combustion chamber above the same and having a central opening in its top, a dome rising from the opening, a smoke outlet connected to the
60 dome, a skirting depending from the opening, a baffle plate spaced from the skirting and comprising a frusto-conical plate located below the skirting and extending at its edge in close proximity to the wall of the
65 combustion chamber, a fuel magazine in the combustion chamber and passing through and supported by the baffle plate, and a fuel chute leading to the magazine.

In testimony that I claim the foregoing
70 as my own, I have hereto affixed my signature in the presence of two witnesses.

ARCHIBALD ROBERTSON.

Witnesses:

J. B. GREENFIELD,
W. J. GREENFIELD.