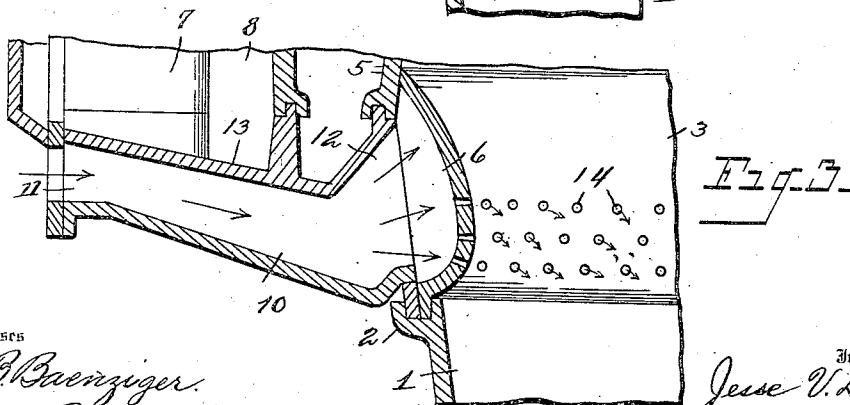
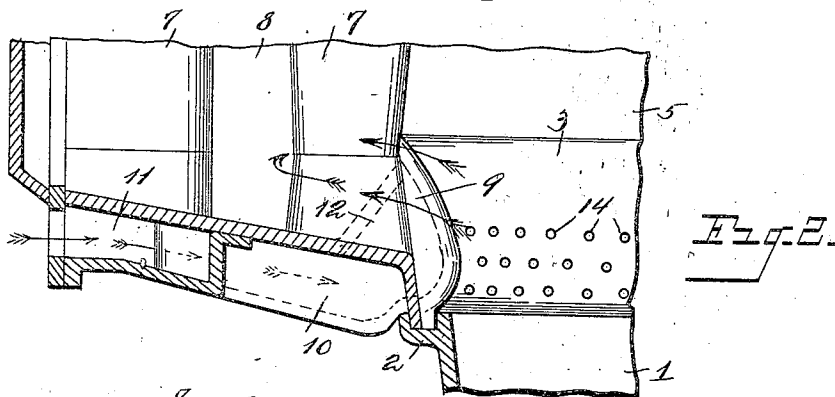
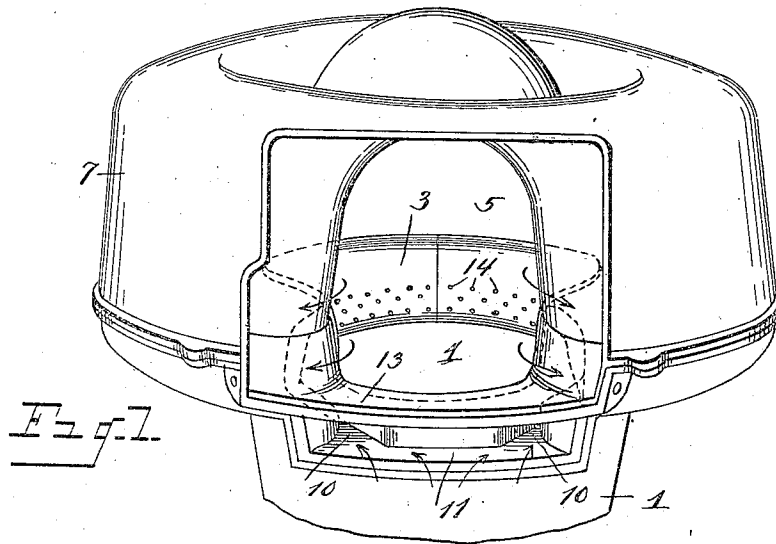


J. V. DAILEY.
WARM AIR FURNACE.
APPLICATION FILED DEC. 4, 1911.

1,042,650.

Patented Oct. 29, 1912.

2 SHEETS—SHEET 1.



Witnesses

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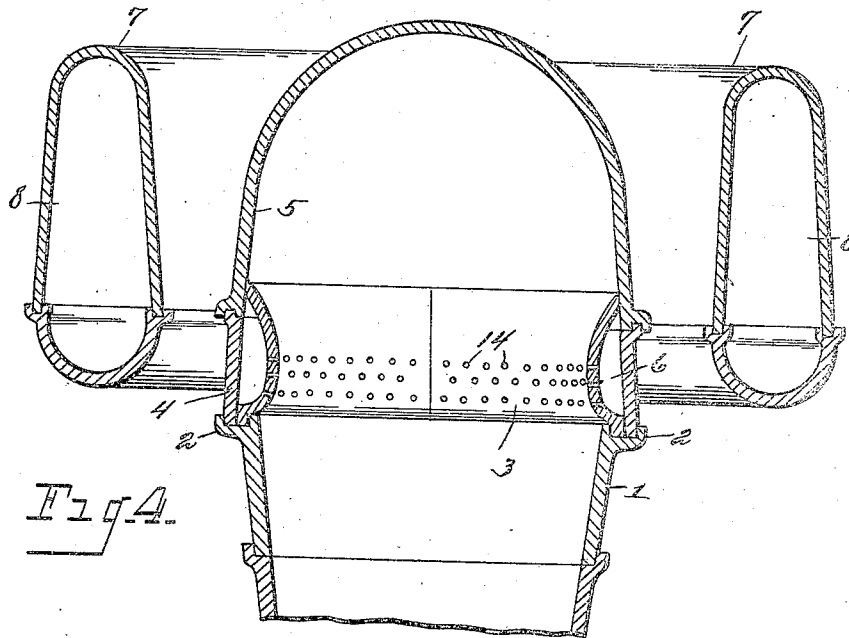


Fig. 4.

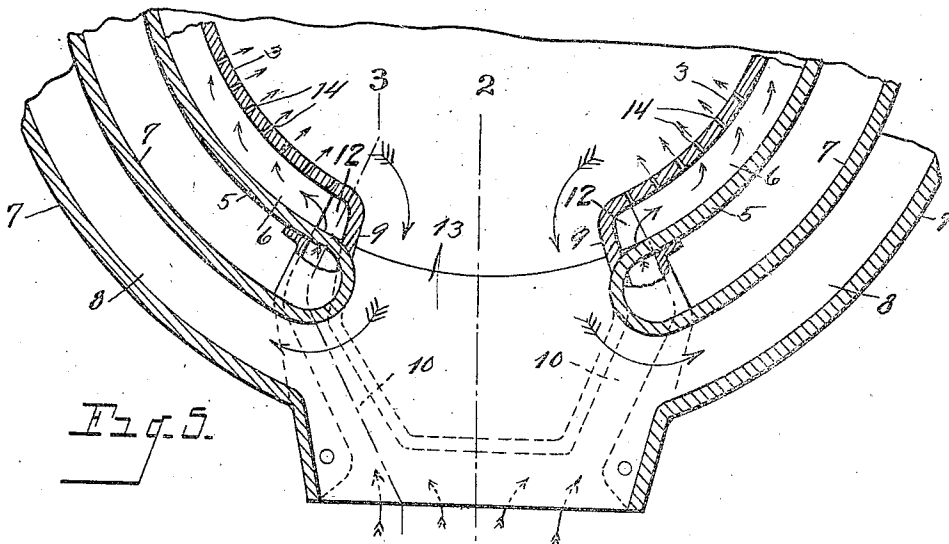


Fig. 5.

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UNITED STATES PATENT OFFICE.

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WARM-AIR FURNACE.

1,042,650.

Specification of Letters Patent.

Patented Oct. 29, 1912.

Application filed December 4, 1911. Serial No. 663,677.

To all whom it may concern:

Be it known that I, JESSE V. DAILEY, a citizen of the United States, residing at Detroit, in the county of Wayne, State of Michigan, have invented certain new and useful Improvements in Warm-Air Furnaces; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to warm air furnaces and consists in the construction and arrangement of parts hereinafter more fully set forth and pointed out particularly in the claims.

The object of the invention is to provide simple and efficient means for introducing through suitable ducts an air blast into the combustion chamber over the top of the burning fuel in the fire pot, and the invention contemplates such disposition of said air ducts with respect to the path of travel of the products of combustion as will cause the products of combustion on their way to the smoke pipe to pass around and over said ducts in a manner to superheat the air before its entrance into the combustion chamber.

The above object is attained by the construction illustrated in the accompanying drawings, in which:—

Figure 1 is a perspective view of the combustion chamber and radiator of a furnace embodying my invention, the fire pot being broken away and the casing of the furnace being omitted. Fig. 2 is an enlarged fragmentary view in section through the feed door opening of the furnace, and through the top of the fire pot, as on line 2—2 of Fig. 5, showing one of the air ducts leading to the perforated ring at the top of the fire pot, and also showing the path of travel of the products of combustion, Fig. 3 is a sectional view through one of the air ducts, and through the perforated ring and a portion of the fire pot, as on line 3—3 of Fig. 5. Fig. 4 is a central vertical section through

the combustion chamber, radiator, and the upper portion of the fire pot, and through the perforated ring which forms the inner wall of an annular air chamber at the top of the fire pot into which the air blast is directed. Fig. 5 is an enlarged fragmentary view in horizontal section through the radiator and through the annular air chamber above the fire pot, said section being taken through the feed door opening above the air ducts leading into said air chamber.

Referring to the characters of reference, 1 designates the fire pot which may be of any suitable construction, and which, at its upper edge, is provided with a channeled flange 2. Seated in the channeled flange of the fire pot is a perforated ring 3, and the lower annular section 4 of the combustion chamber, the complementary portion of the combustion chamber being formed by a dome shaped section 5 which rests upon and is supported by the lower section 4. The perforated ring 3 is curved laterally so as to project inwardly and slightly overhang the top of the fire pot. By reason of the lateral or transverse curvature of the perforated ring an annular air space 6 is formed between said ring and the lower section of the combustion chamber. The upper edge of the perforated ring contacts the inner wall of the combustion chamber in a manner to prevent the escape of air from the chamber 6 at that point, as clearly shown in Figs. 3 and 4. The usual radiator 7 is employed affording the flue passages 8 for the products of combustion, which lead to the smoke pipe, not shown, as will be well understood in the art. The feed opening is provided which communicates in the usual way with the combustion chamber above the fire pot, the door for closing said opening being omitted. The arrangement is such that the products of combustion from the combustion chamber pass outwardly some distance into the feed opening and thence into the flues 8 leading to the smoke pipe.

The perforated ring 3 is an open ring, the terminals of which bend outwardly, as shown at 9 in Fig. 5, and contact the wall of the combustion chamber, thereby closing the ends of the annular air space or chamber 6,

which terminates on each side of the feed opening. Below the feed opening are two air ducts 10 whose outer ends communicate with the atmosphere through a common opening 11, as shown in Fig. 1, and whose inner ends diverge and communicate with the air space or chamber 6 on each side of the feed opening through upwardly extending terminals 12. The bottom 13 of the feed opening forms the top of the air ducts 10 for the major portion thereof, while the upwardly inclined terminals 12 of said ducts rise somewhat above said bottom of the feed opening. By this arrangement the fire travel from the combustion chamber into the flues 8 is around the terminals 12 of the air ducts and over the tops of said ducts, whereby the air blast drawn into the air space 6 from said ducts by the circulation within the combustion chamber becomes superheated and is discharged through the perforations 14 in the ring 3 in the form of a hot blast which is projected over the top of the fire in the fire pot and commingled with the products of combustion, whereby the gas and smoke are consumed to a great extent, resulting in the extraction of a greater number of heat units from a given quantity of fuel and increasing the efficacy of the furnace.

In a furnace constructed as herein shown and described, the passage of the products of combustion from the combustion chamber will create a partial vacuum therein, causing a suction of air through the perforated ring into the fire pot, and creating a strong inflow of air through the ducts 10 into the air chamber 6, which inflowing air in passing through said ducts becomes highly superheated as before explained. This superheated air which passes into the combustion chamber from the air space 6 through the perforations in the ring 3 at once mixes with the gases liberated from the burning coal, forming a combustible mixture which burns in jets of visible flame from said perforations. By introducing a blast of superheated air into the combustion chamber over the fuel, the gases liberated from the burning coal are not chilled, and oxygen is supplied in sufficient quantity to support combustion at a point in the combustion chamber not ordinarily supplied with sufficient air to burn the liberated gases, whereby the smoke and gases are consumed to a great extent, and the heat generated by the combustion thereof is utilized, while at the same time excessive smoke from the burning coal is obviated.

Having thus fully set forth my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A fire pot, an annular air space at the top of the fire pot, a perforated wall through which communication is established between

said air space and the fire pot, a fuel feed passage communicating with the fire pot between the terminals of said air space, a flue for the products of combustion communicating with said feed passage, and air ducts communicating at their inner ends with the terminals of said air space and open to atmosphere at their outer ends, said ducts being disposed below and adjacent the bottom of said feed passage whereby the fire travel from the fire pot through said passage to said flue shall be over said air ducts.

2. In a furnace, a fire pot, a feed opening communicating with said fire pot, a curved perforated ring located at the top of the fire pot and forming an annular air space which communicates with the top of the fire pot through the perforations therein, said ring having outwardly bent terminals which contact the wall of the combustion chamber on each side of the point of communication of said feed opening with said fire pot and close the terminals of said annular air space, a flue for the products of combustion communicating with said feed opening on opposite sides thereof, and air ducts communicating at their inner ends with the terminals of said annular air space respectively, and open at their outer ends to atmosphere, said ducts lying below and adjacent the bottom of said feed opening whereby the travel of the products of combustion from the combustion chamber to said flue shall be over said air ducts.

3. In a furnace, a combustion chamber, a fire pot having a channel in its upper edge, a laterally curved perforated ring seated at its lower edge in said channel and at its upper edge contacting the wall of the combustion chamber to form an annular air space, the terminals of said ring being bent into contact with the wall of the combustion chamber to close the ends of said air space, a feed opening communicating with the fire pot between the terminals of said ring, a flue for the products of combustion communicating with the feed opening on opposite sides thereof, and air ducts whose upper walls are formed by the bottom of the feed opening communicating at their inner ends with the terminals of said air space respectively, and open at their outer ends to atmosphere, whereby the path of travel of the products of combustion to said flue through said feed opening shall be over said air ducts.

4. A fire pot, an annular air space at the top of the fire pot having spaced terminals, means for effecting communication between the fire pot and said air space, a horizontal feed passage communicating with the fire pot between the terminals of said air space, a flue for the products of combustion communicating with said passage, and air ducts communicating at their inner ends with the

terminals of said air space respectively, and
open at their outer ends to atmosphere, said
ducts being disposed adjacent the bottom
of the feed passage whereby the travel of
5 the products of combustion from the fire pot
through said passage to said flue shall be
over said ducts.

In testimony whereof, I sign this specification in the presence of two witnesses.

JESSE V. DAILEY.

Witnesses:

J. OTTO BAENZIGER,
M. E. BROESAMLE.