

June 14, 1932.

R. SANDWICK ET AL

1,862,985

AIR HUMIDIFYING FURNACE

Filed Nov. 1, 1930

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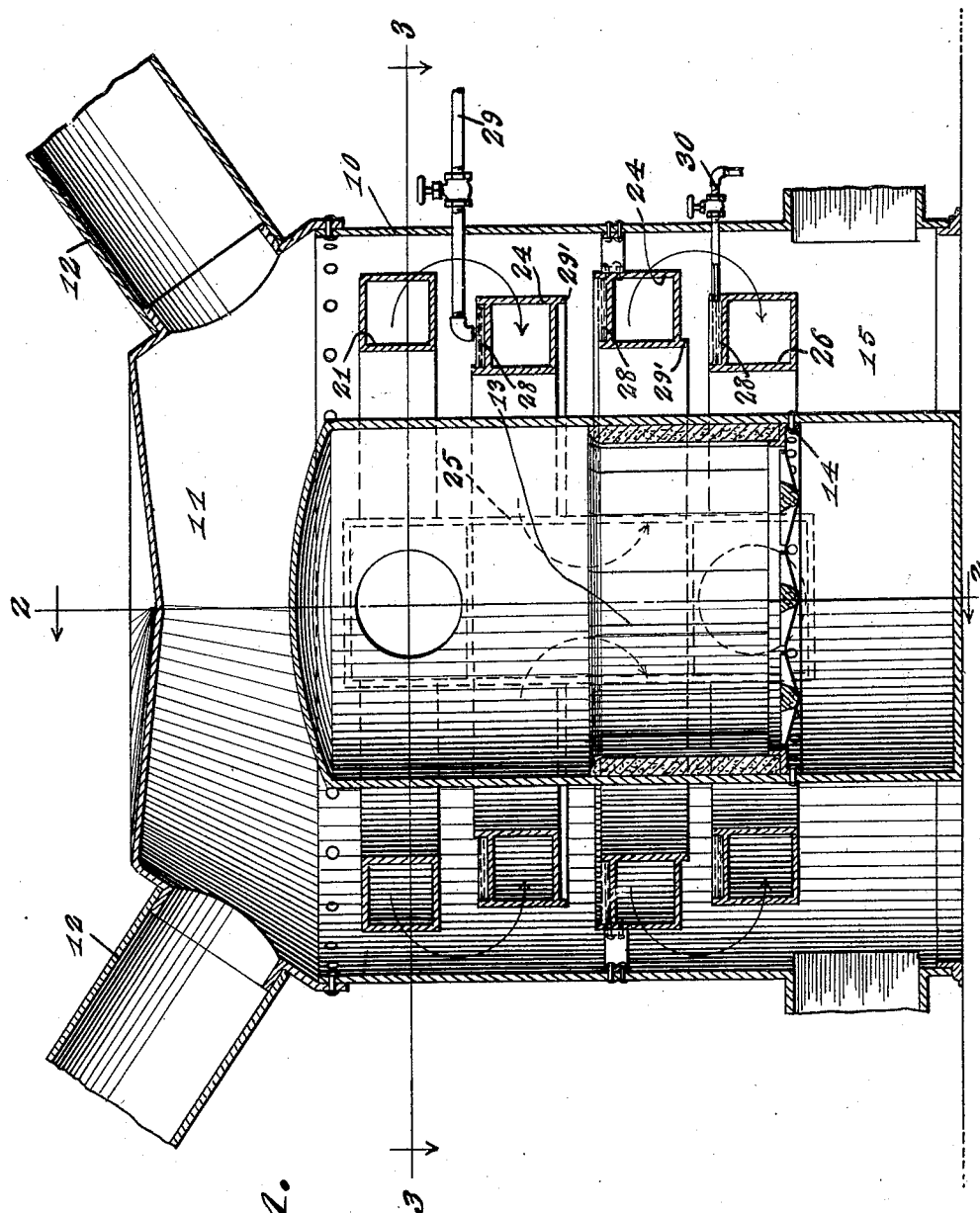


Fig. 1.

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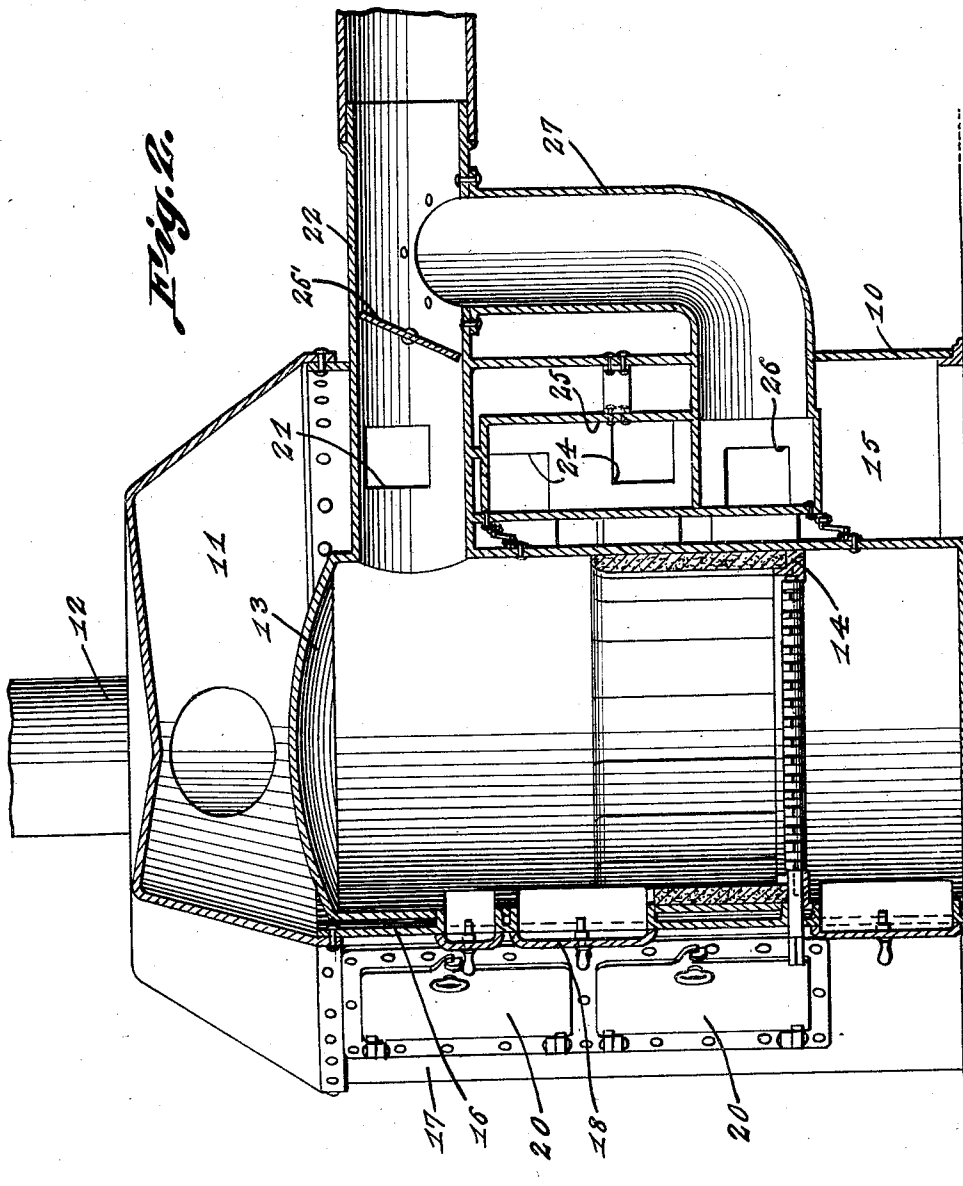
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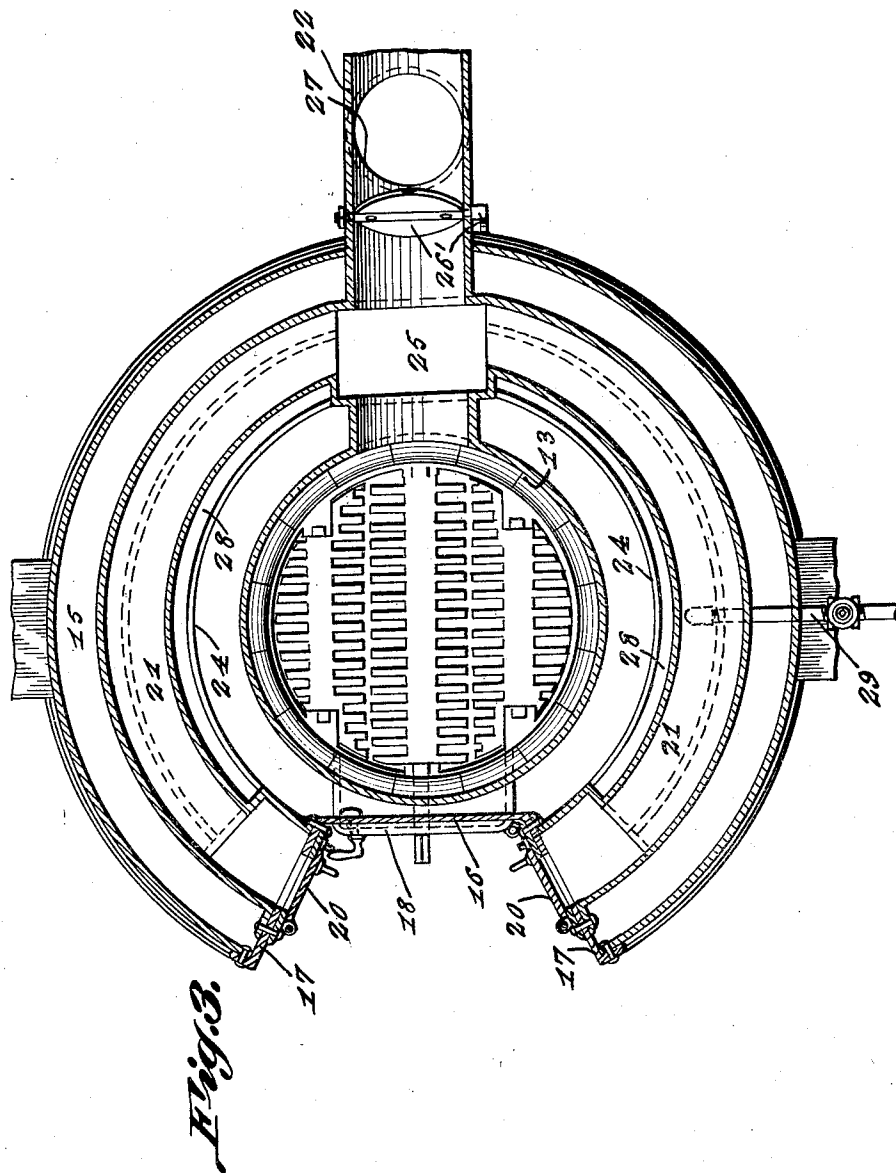
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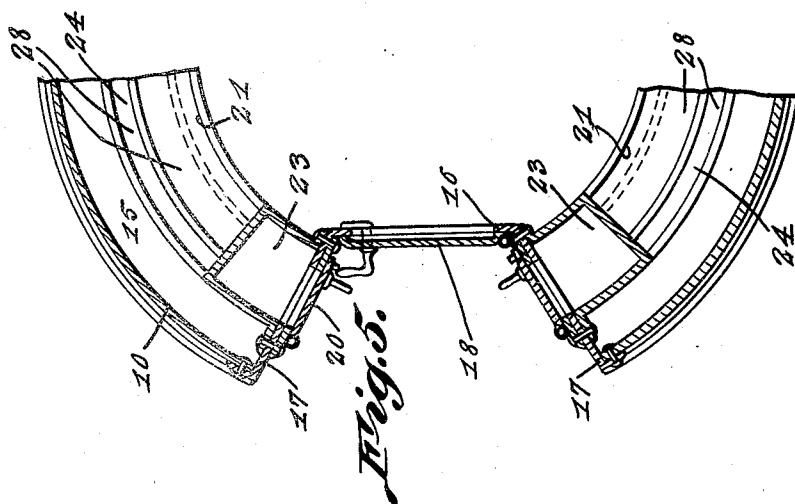
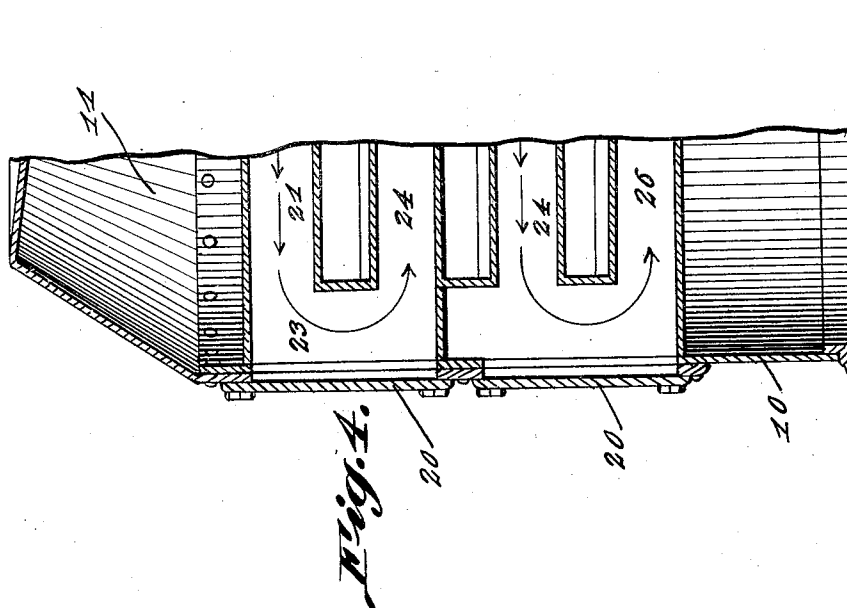
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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

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AIR HUMIDIFYING FURNACE

Application filed November 1, 1930. Serial No. 492,838.

This invention relates to certain new and useful improvements in furnaces of the hot air type embodying among other characteristics the provision and arrangement of a circulating smoke flue for the purpose of utilizing the heat from the fuel to the utmost thereby increasing the heating capacity of the furnace whereby the maximum amount of heat or minimum amount of fuel may be derived.

Another of the objects of the invention consists of a water trough upon the smoke flue.

An additional object of the invention comprises the arrangement of the several whirls or coils of the circulating flue in staggered relation whereby the overflow of the water precipitating from one coil or whirl to the other will be assured.

With the above and other objects in view, the invention further consists of the following novel features and details of construction, to be hereinafter more fully described, illustrated in the accompanying drawings and pointed out in the appended claims.

In the drawings:

Figure 1 is a vertical sectional view taken through the invention.

Figure 2 is a vertical sectional view taken on line 2—2 of Figure 1.

Figure 3 is a horizontal sectional view taken on line 3—3 of Figure 1.

Figure 4 is a fragmentary longitudinal sectional view taken through the stove and smoke flues and illustrative of the particular construction involved and the circulation of the smoke and heat therethrough.

Figure 5 is a fragmentary horizontal sectional view taken through the front of the furnace showing the connectors for those whirls or coils of the smoke flue to opposite sides of the fuel door.

Referring to the drawings in detail wherein like characters of reference denote corresponding parts, the reference character 10 indicates generally the housing of our particular form of hot air furnace which forms a heat collecting dome 11 within the top thereof having outlet pipes 12 in communication therewith. The stove heating chamber 13 is provided with a combination grate and

fire brick or clay support in the nature of a ring 14.

The compartment 15 defined between the adjacent walls of the housing 10 and stove heating chamber 13 has its circuitous course broken therebetween by a wall 16 having side flanges 17. The wall 16 and the flanges 17 carry a coal or fuel door 18 and flue clean-out doors 20 respectively.

Circulating flues 21 have connection at their rearmost inwardly projecting ends with the furnace flue pipe 22 and upon opposite sides thereof and through which the smoke may be transmitted transversely of the furnace in arcuate paths toward opposite sides of the fuel door 16 for communication with passages 23 vertically disposed behind the doors 20.

A succession of circulating flues 24 of arcuate formation arranged in staggered relation within the compartment 15 are joined or otherwise communicated at their rearmost inwardly projecting ends through the employment of a housing 25. The lowermost flue sections 26 are in communication with the furnace flue pipe 22 beyond the damper 26' therefor through the provision and arrangement of a conduit 27. From an understanding of the Figure 4 illustration, it is gathered that the forward innermost projecting ends of the circulating flues 24 are also disposed for communication in a manner similar to that provided for the flues 21. The flues 24 differ from the flues 21, however, in that the former are provided with troughs 28 upon the upper surfaces thereof to accommodate bodies of water constantly replenished by a feed pipe 29 whereby the uppermost of the troughs, when overfilled, will allow the water to trickle down one side thereof due to the fact that one side wall of the trough is lower than the other.

A drip flange 29', carried upon the under sides of the intermediate flues 24, are located immediately above the troughs of the next succeeding lowermost troughs whereby the water precipitating from the uppermost of the flues will be deposited within the trough of the lowermost flue. The trough of the lowermost of the flues is provided with a drain

pipe 30. The latter is merely provided as a precaution against overfilling of the troughs inasmuch as it is our purpose to circulate enough of the ordinary wasted heat and smoke through the flues for the purpose of transforming the water within the troughs into steam whereby the air emitted through the conduits 12 will be of a humidified character. The shutting of the damper 26 to cut off the flow of smoke and wasted heat through the furnace flue pipe 22 will cause the smoke and heat to travel laterally through the entrance ends of the flues 21 toward the front of the furnace downwardly through the passages 23 for communication with the interior of the uppermost of the flues 24. This is repeated until the last of the flues is reached which opens into the conduit 27 to emit the spent smoke through the furnace flue pipe 22 beyond the damper 26'.

The invention is susceptible of various changes in its form, proportions and minor details of construction and the right is herein reserved to make such changes as properly fall within the scope of the appended claims.

Having described the invention, what is claimed is:—

1. A heating furnace comprising a heating chamber, a housing enclosing said chamber and spaced therefrom to provide a compartment therebetween, a flue pipe, smoke flues projecting laterally within the compartment, complemental smoke flues in communication with the first mentioned flues having a point of discharge beyond the inlet ends of the first mentioned flues, and water troughs carried upon the complemental flues.

2. A hot air furnace comprising a combustion chamber having a housing enclosing said chamber and spaced therefrom to provide a compartment therebetween in communication with the heat collecting dome of the furnace, a flue pipe, smoke flues having communication and laterally projecting from the flue pipe within said compartment, complemental smoke flues arranged in staggered relation within the compartment and in communication with the other ends of the first mentioned smoke flues, a housing establishing communication between the other ends of the complemental smoke flues, water troughs carried upon the upper sides of the complemental smoke flues, and the lowermost of the complemental smoke flues being in communication with the furnace flue pipe beyond the entrance ends of the first mentioned smoke flues.

3. A hot air furnace comprising a combustion chamber having a housing enclosing said chamber and spaced therefrom to provide a compartment therebetween in communication with the heat collecting dome of the furnace, a flue pipe, smoke flues having communication with and laterally projecting from the flue pipe within said compart-

ment, complemental smoke flues arranged in staggered relation within the compartment and in communication with the other ends of the first mentioned smoke flues, a housing establishing communication between the other ends of the complemental smoke flues, water troughs carried upon the upper sides of the complemental smoke flues, drip flanges for the complemental smoke flues disposed immediately above the troughs of the next succeeding flues, and the lowermost of the complemental smoke flues being in communication with the furnace flue pipe beyond the entrance ends of the first mentioned smoke flues.

In testimony whereof we affix our signatures.

ROBERT SANDWICK.
EMIL DAHLSTROM.