

Aug. 11, 1953

E. KENT

2,648,324

GAS FIRED AIR-HEATING FURNACE

Filed Aug. 3, 1949

4 Sheets-Sheet 1

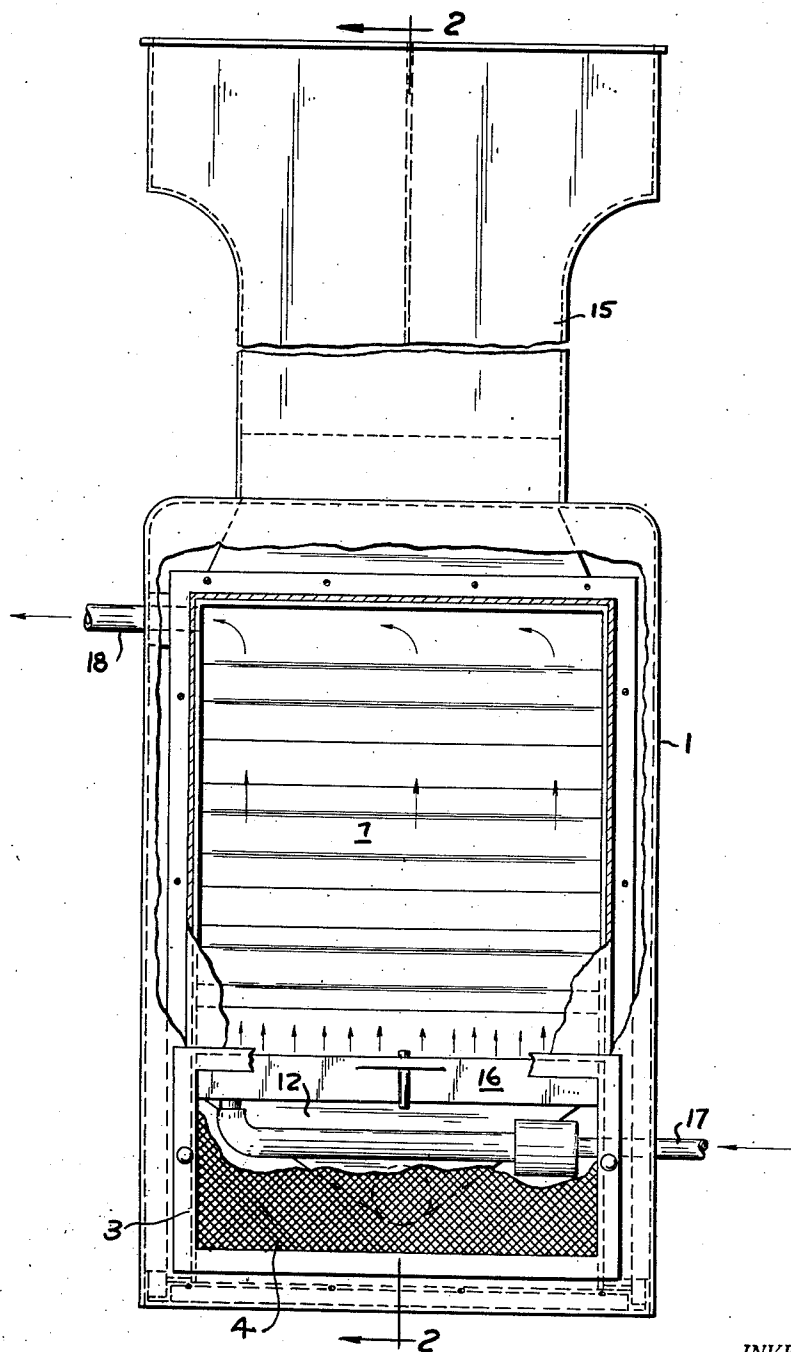


Fig. 1

INVENTOR.
EDWARD KENT.
BY
Charles E. M. ...
ATTORNEY.

Aug. 11, 1953

E. KENT

2,648,324

GAS FIRED AIR-HEATING FURNACE

Filed Aug. 3, 1949

4 Sheets-Sheet 2

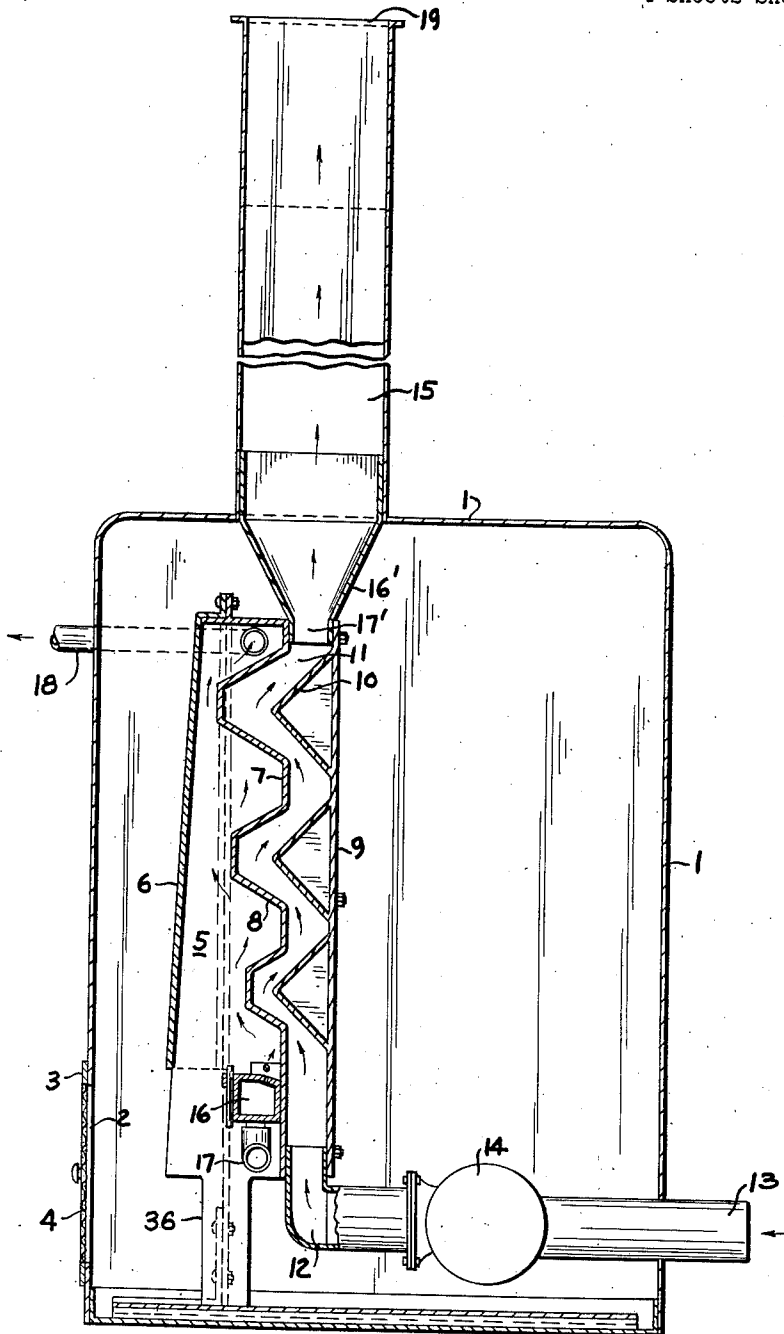


Fig. 2

INVENTOR.

EDWARD KENT

BY

Charles E. Nixon

ATTORNEY.

Aug. 11, 1953

E. KENT

2,648,324

GAS FIRED AIR-HEATING FURNACE

Filed Aug. 3, 1949

4 Sheets-Sheet 3

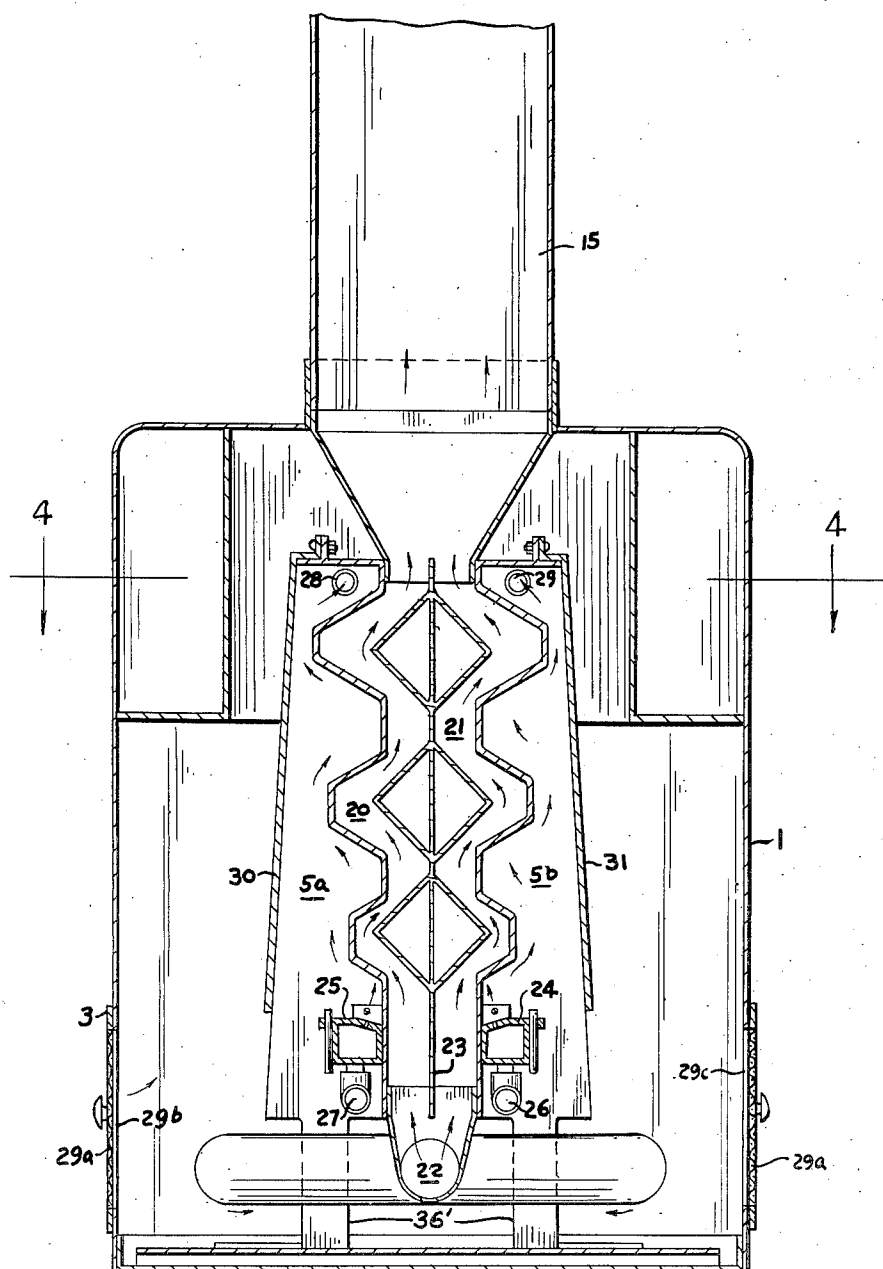


Fig. 3.

INVENTOR.
EDWARD KENT.

BY

Charles E. Hines

ATTORNEY.

Aug. 11, 1953

E. KENT

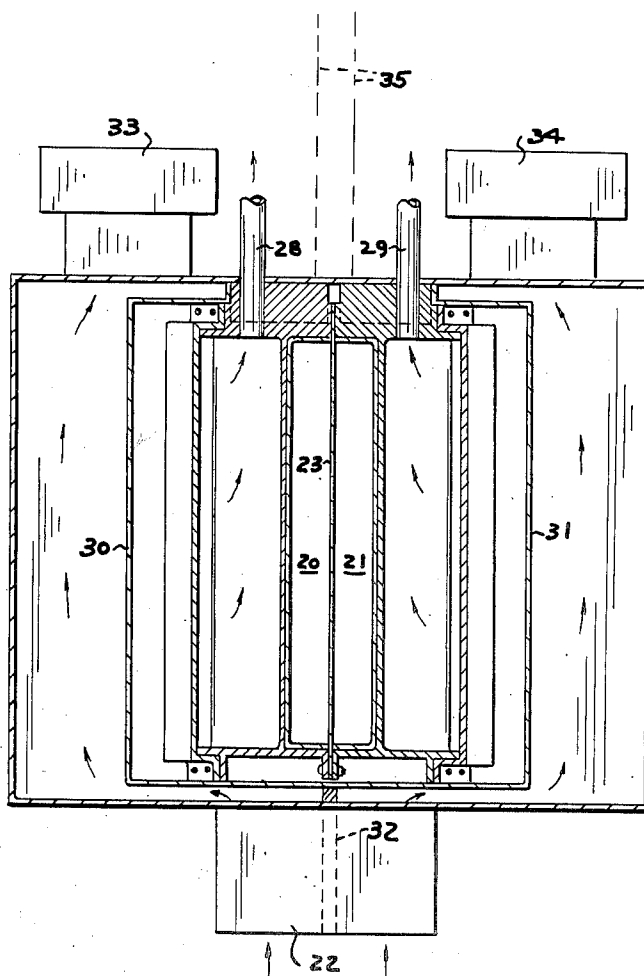
2,648,324

GAS FIRED AIR-HEATING FURNACE

Filed Aug. 3, 1949

4 Sheets-Sheet 4

Fig. 4.



INVENTOR.

EDWARD KENT.

BY

Charles E. Kraus

ATTORNEY.

UNITED STATES PATENT OFFICE

2,648,324

GAS FIRED AIR-HEATING FURNACE

Edward Kent, Detroit, Mich., assignor, by direct and mesne assignments, of twenty-two per cent to Charles E. Wisner, twenty-two per cent to Clarence J. McLeod, and twenty per cent to Carlton F. Brown

Application August 3, 1949, Serial No. 108,249

1 Claim. (Cl. 126—116)

1

2

This invention relates to a heating apparatus the object being to provide a new and improved form of a heater whereby air of an enclosed space may be maintained at a desired temperature irrespective of the variations in the temperature of the air externally of the space being heated.

These and other objects and features of the invention are hereinafter more fully described and claimed and apparatus embodying my invention is shown in the accompanying drawing in which—

Fig. 1 is a front elevation of the device portions thereof being broken away to show the interior structure.

Fig. 2 is a section taken on line 2—2 of Fig. 1.

Fig. 3 is similar to Fig. 2 illustrating a modification thereof; and

Fig. 4 is a section taken on line 4—4 of Fig. 3.

The device, according to my invention, includes a chambered member 1 having an opening 2 in one side thereof adjacent its lower end. A frame element 3 is detachably secured to a side wall of member 1 and the screen element 4 is positioned in the frame. Air from atmosphere or an enclosed space may enter member 1 through said screen. Within member 1 is a chambered member 5 which has an imperforate wall 6 as shown more clearly in Fig. 2 and an inner wall 7 is shaped to provide transverse recesses 8.

One side of the plate 9 is provided with projecting elements 10 which form a tortuous passageway 11 which is open at its lower end to receive the conduit 12 which opens to atmosphere at the end 13. A blower 14 is positioned in the conduit 12 which takes air from atmosphere and discharges the same through the tortuous passageway and through the conduit 15 which opens to the space to be heated. A gas burner 16 is provided at the lower end of the chamber 5 and gas is supplied thereto by means of the conduit 17. When the gas is ignited it flows over the surface of the member 7 and the products of combustion discharge through the conduit 18 to atmosphere. The air in the passageway 11 is heated and passes to the conduit 15 into the space to be heated.

At the lower end of the conduit 15 is a cone shaped element 16' opening at 17' to the tortuous passageway 11 and the upper open end 19 of the conduit 15, through which heated air is discharged, opens to the space being heated. By this arrangement of parts fresh air is discharged through the passageway 11 and becomes heated and passes to the space being heated. Thus no

gas fumes are present in the air discharged from the apparatus.

In the form of the invention shown in Figs. 3 and 4 there are two tortuous passageways 20 and 21 for flow of air from the inlet conduit 22 on opposite sides of the partition wall 23.

At the lower end of each of the two passageways upon the exterior thereof is a burner 24 and 25 respectively which are supplied with gas by means of the respective conduits 26 and 27 open to a source of fuel supply. The products of combustion from the burners pass to atmosphere through the respective conduits 28 and 29. Thus no fumes from the burning gas can enter the space being heated and the heated air passes through the conduit 15 to the space being heated. By means of the tortuous or zig-zag passageways the burning gases remain therein for a longer period of time than would be the case if the passageways were straight. This character and arrangement of parts prevents material heat loss to atmosphere through the conduit 18 of Fig. 1 or the conduits 28 and 29 of Figs. 3 and 4.

It is to be noted that the body 1, Fig. 3, has an opening 29b on one side thereof and an opening 29c on the opposite side. Each opening is preferably provided with a screen 29a permitting air from the space being heated to flow through the tortuous passageways between the enclosing walls 30 and 31 and over the burners 24 and 25 and is discharged through the conduits 28 and 29 to atmosphere. Thus no gas fumes may enter the air stream flowing to the space being heated.

In the dual form of the invention shown in Figs. 3 and 4 a dividing wall 32 is provided in the inlet to cause air to flow to both the right and left hand sides of the body as indicated by the arrows and then to the respective outlets 33 and 34 and may discharge to separate rooms on opposite sides of a dividing wall as indicated by dotted lines 35 in Fig. 4.

In either form of the invention, as shown in Figs. 2 and 3 respectively, the passageway 11 in Fig. 2 and the passageways 20 and 21 in Fig. 3 are zig-zag in form to increase the time period of flow of air from the inlet 22 to the outlet 15 thereby increasing the temperature of the air discharging to the outlet and permitting a greater absorption of heat prior to discharge to the space being heated.

It is further to be noted that in either of the forms of the invention there is no possibility of gas fumes entering the air stream discharging to the space being heated due to the air passage-

3

way 11 of Fig. 2 or 20 and 21 of Fig. 3 being sealed from the chamber 5 of Fig. 2 or 5a and 5b of Fig. 3. Standard 36, Fig. 2, supports combustion chamber 5-6, while standards 36' support combustion chambers 5a-30 and 5b-31 in Fig. 3.

The device may be used in a house or enclosed space or in a trailer or other covered vehicle. In either case bottle gas or natural gas could be used and connected with the element 17 shown in Figs. 1. and 2.

Having thus briefly described my invention, its utility and mode of operation, what I claim and desire to secure by Letters Patent of the United States is:

Apparatus for heating an enclosed space comprising an upright chambered member having a front wall with an air inlet opening at its bottom, a hollow upright enclosed combustion chamber of rectangular cross-sectional shape positioned within said chambered member above its bottom and having an air inlet at its lower end adjacent the said air inlet opening, an upright standard within said chambered member resting upon the bottom thereof and supportably engaging said combustion chamber, an elongated gas burner of rectangular cross-section horizontally arranged centrally within said combustion chamber above its lower end and connected to a source of supply, an exhaust pipe at the upper end of said combustion chamber projecting outwardly through said chambered member, a hollow upright fresh air conduit of longitudinal zigzag shape extending through said combustion chamber adjacent said burner and arranged so

4

that elements of its walls are arranged progressively closer to the adjacent wall of said combustion chamber towards its upper end whereby the walls of said fresh air conduit are impinged upon by the upward movement of the products of combustion, said gas burner being disposed adjacent the outer surface of the wall of said fresh air conduit, an air outlet pipe upon said chambered member joined at one end to the upper end of said conduit with its other end adapted to open to said enclosed space to be heated, and a fresh air pipe projecting into said chambered member with its inner end joined to the lower end of said conduit and with its outer end in communication with a fresh air source.

EDWARD KENT.

References Cited in the file of this patent

UNITED STATES PATENTS

20	Number	Name	Date
	268,083	Detwiler -----	Nov. 28, 1882
	364,124	McClary -----	May 31, 1887
	576,350	Munk -----	Feb. 2, 1897
	969,749	DeForrest -----	Sept. 6, 1910
25	1,541,512	Knisley -----	June 9, 1925
	1,606,494	Barnhart -----	Nov. 9, 1926
	1,751,399	Ducart -----	Mar. 18, 1930

FOREIGN PATENTS

30	Number	Country	Date
	21,152	Great Britain -----	Sept. 12, 1910
	550,366	France -----	Dec. 11, 1922
	217,416	Switzerland -----	Mar. 2, 1942