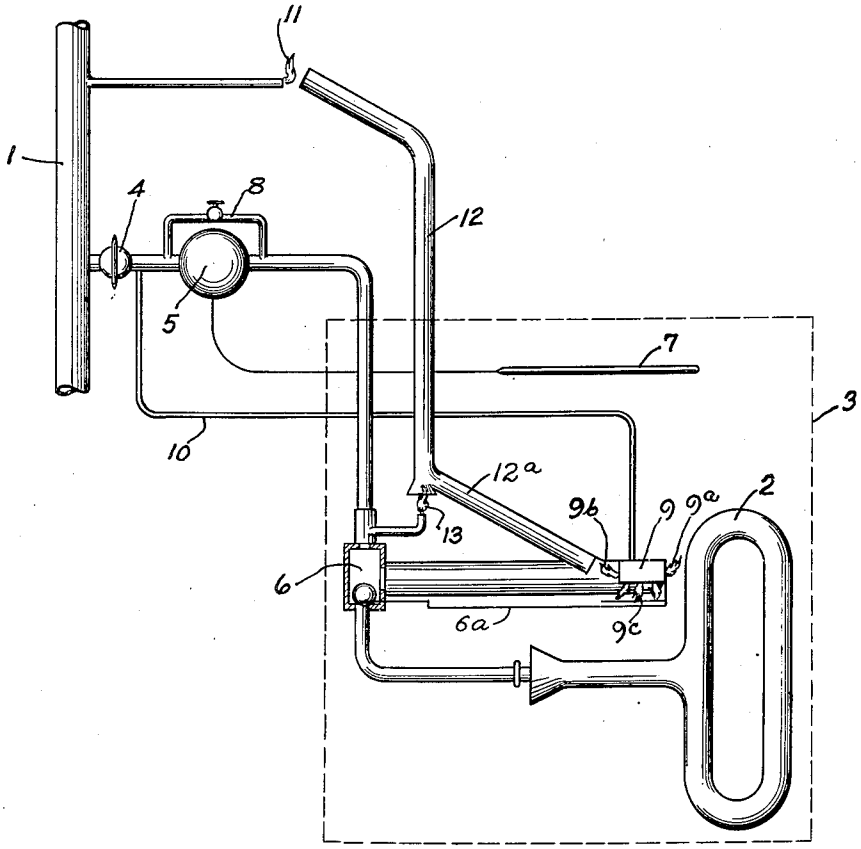
Aug. 29, 1950 W. D. ANTRIM 2,520,299

SAFETY CONTROL MEANS WITH FLASH TUBE FOR OVEN BURNERS

Filed Feb. 1, 1946



INVENTOR.
WILLIAM D. ANTRIM
BY Frank R. Higley
ATTORNEY

Patented Aug. 29, 1950 2,520,299

UNITED STATES PATENT OFFICE

2,520,299

SAFETY CONTROL MEANS WITH FLASH TUBE FOR OVEN BURNERS

William D. Antrim, Cleveland, Ohio, assignor, by mesne assignments, to Affiliated Gas Equipment, Inc., Cleveland, Ohio, a corporation of Delaware

Application February 1, 1946, Serial No. 644,887

2 Claims. (Cl. 158—117.1)

1

This invention relates to automatic ignition and safety devices for gas burners, and is particularly adapted for application to the oven burner of a gas cooking range wherein a constantly burning pilot, such as the usual top burner pilot, is available for ignition of the safety pilot which immediately serves the oven burner, by way of flash tube means effective to be energized by the safety pilot for ignition thereof from the constant pilot.

Still more particularly the invention pertains to such applications wherein the flash tube means is so long or so complicated in form, as by other structure or disposition of other parts in the range, as to necessitate the employment of a flash pilot burner in association with the flash tube means; as will be appreciated by one familiar with the art.

Objects of the invention are to so relate such flash pilot burner with other parts of the range and particularly the gas circuits thereof, that automatic control of the flash pilot burner results, to effect economical and otherwise improved operation thereof as will appear; the improved arrangement also providing lower gas consumption of the safety pilot burner, also as will appear.

Another object is to accomplish these ends by much simpler means than have heretofore been considered necessary in the art.

Further objects and advantages will be apparent from the following description taken in connection with the accompanying drawing, which is a diagrammatic and conventionalized view showing pertinent parts of a gas range, and the interrelation of such parts, illustrative of the invention.

With reference now to the drawing: 1 is the gas supply pipe, which may be the usual manifold from which the various range burners such as top burners, not illustrated, have connection subject to their usual individual control valves.

2 is a main burner located within the oven of the range as indicated by the broken line 3.

The burner 2 has a gas supply line as indicated and including the manual valve 4, thermostatic valve 5 and automatic safety shut-off valve 6 arranged to be sequentially effective in the line from the manifold 1 to the burner 2 as is usual and well known in the art.

The thermostatic valve 5 is a throttling valve responsive to a thermal element 7 within the oven 3 and has the usual associated by-pass 8 by which provision is made for low limit flow independent of the thermal element 7.

The safety valve 6 is arranged to be responsive to safety pilot burner means generally indicated at 9, by means the details of which are not here material; it being sufficient to here state that the pilot burner means 9 includes provision for a

2

flame portion 9a in igniting relation with the burner 2, a flame 9b whose purpose will hereinafter appear, and a flame portion 9c to which the valve 6 is subject, as through a thermally responsive element 6a—it being understood that so far as this invention is concerned the described flame portions of the pilot burner means 9 act as a single flame in that they are in constantly igniting relation with each other.

This pilot burner means 9 has gas supply as thru a line 10 subject to the operator-controlled valve means 4, and ahead of or otherwise independent of the thermostatic valve means 5 as well as the safety valve 6.

A constantly burning pilot burner 11 which may be located above the level of the oven burner 2 to be employed for ignition of the range top burners, is served from the manifold 1.

According to this invention I employ the following means providing automatic ignition for the safety pilot burner 9 from the constant pilot burner 11 as follows:

A flash tube 12 is disposed to lead generally between the constant pilot burner 11 and the safety pilot 9 with ends thereadjacent, and a flash pilot burner 13 is associated with the flash tube 12 intermediate its ends; the flash tube 12 having a rising portion indicated with a bottom opening adjacent the flash pilot and a sloping portion 12a arranged to receive gas charge from the pilot burner 9b and have ignition from the pilot burner 13. The arrangement is such that when gas is admitted to both the safety pilot burner 9 and the flash pilot burner 13, the flash pilot will have ignition from the constant pilot burner 11 by way of the intervening portion of the flash tube 12; and the portion 9b of the safety pilot burner, and therefore the safety pilot burner as a whole, will have ignition from the flash pilot burner 13 by way of the intermediate portion of the flash tube 12.

The flash pilot burner 13 has its gas supply as indicated in the drawing, effectively ahead of the safety valve 6 but after and therefore subject to the manual valve 4 and the thermostatic valve 5.

Operation will be as follows, commencing with the oven burner out but the constant pilot 11 operating. Under these conditions the manual valve 4 is closed, the thermally responsive valve 5 is open, the safety valve 6 is closed and the flash pilot burner 13 and safety pilot burner 9 not operating.

To start the oven burner 2 the operator opens the manual valve 4. This admits gas to the safety valve 6 and flash pilot burner 13 by way of the thermostatic valve 5, and admits gas to the safety pilot burner 9 by way of the line 10, such gas being at substantially full line pressure.

The gas emerging from the flash pilot burner

13 and at the part 9b of the safety pilot burner charges the entire flash tube 12 to provide ignition of the flash pilot burner from the constant pilot burner 11, and ignition of the safety pilot burner from the flash pilot burner. Ignition of the safety pilot burner 9 causes opening of the safety valve 6 to admit gas to the main burner 2 which is ignited by the safety pilot burner part 9a. After the oven is heated up by the main burner 2, the thermal element 7 causes the thermostatic valve 5 to throttle down, it being understood that the throttling action of the thermostatic valve is a function of the presetting of the valve by the operator to the desired oven temperature. Such throttling is effective upon the flash pilot burner 13 as well as the main burner 2; but it is not effective upon the safety pilot burner 9 which therefore may be set for a lower rate of consumption than would otherwise be the case.

In case of safety pilot burner outage during oven operation, the safety valve 6 automatically closes to cut off gas from the main burner 2, closing of the safety valve builds up pressure to increase the gas at the flash pilot burner 13 so that a relight of the safety pilot burner 9 automatically occurs, after which the oven burner automatically comes on again.

When the desired oven operation is completed, turning off of the manual valve 4 cuts gas off from all of the outlets described with the exception of the constant burning pilot burner 11.

I claim:

1. In a gas range having an oven with a main burner therein, a constant pilot burner located outside said oven, a safety pilot burner arranged in igniting relation to said main burner, a gas supply line for said main burner including, in sequential arrangement leading thereto, operator-controlled valve means, thermostatic valve means responsive to temperature in said oven, and safety shut-off valve means responsive to said safety pilot burner, and gas supply means for said safety pilot burner leading from said supply line after said operator-controlled valve means and ahead of said thermostatic valve means: means providing automatic ignition for said safety pilot burner from said constant pilot burner, and including flash tube means having an end adjacent said constant pilot burner to receive ignition therefrom, an end adjacent said safety pilot burner to receive gas therefrom, and an intermediate opening, a flash pilot burner associated with said opening to receive ignition

from said top pilot burner and provide ignition for said safety pilot burner, and a connection providing gas supply for said flash pilot burner means leading from said line after said thermostatic valve means and ahead of said safety valve means.

2. In a gas range having an oven with a main burner therein, a constant pilot burner located outside said oven and higher than said main burner, a safety pilot burner arranged in igniting relation to said main burner, a gas supply line for said main burner including, in sequential arrangement leading thereto, operator-controlled valve means, thermostatic valve means responsive to temperature in said oven, and safety shut-off valve means responsive to said safety pilot burner, and gas supply means for said safety pilot burner leading from said supply line after said operator-controlled valve means and ahead of said thermostatic valve means: means providing automatic ignition for said safety pilot burner from said constant pilot burner, and including a flash pilot burner at a location substantially lower than said constant pilot burner, flash tube means having an end adjacent said safety pilot burner to receive gas therefrom, and an end adjacent said flash pilot burner for ignition of said safety pilot burner thereby, said flash tube means also including a rising portion having a lower end arranged to receive gas from said flash pilot means and an upper opening for ignition of said flash pilot burner by said top pilot burner, and a connection providing gas supply for said flash pilot burner means, leading from said line after said thermostatic valve means and ahead of said safety valve means.

WILLIAM D. ANTRIM.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,971,704	Castonguay	Aug. 28, 1934
2,063,834	Bast et al.	Dec. 8, 1936
2,072,034	Geurink et al.	Feb. 23, 1937
2,072,552	Gauger	Mar. 2, 1937
2,082,296	Methudy	June 1, 1937
2,087,433	Hollman	July 20, 1937
2,490,729	Craver et al.	Dec. 6, 1949

FOREIGN PATENTS

Number	Country	Date
827,388	France	Apr. 25, 1938