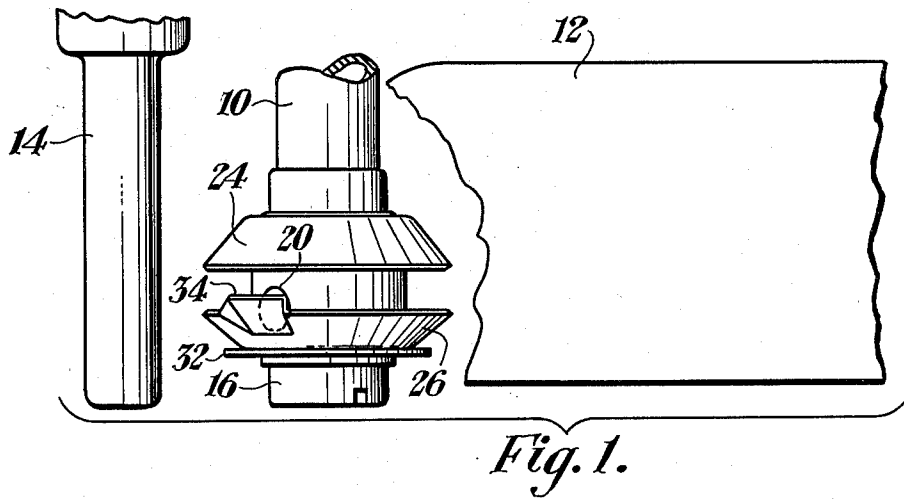
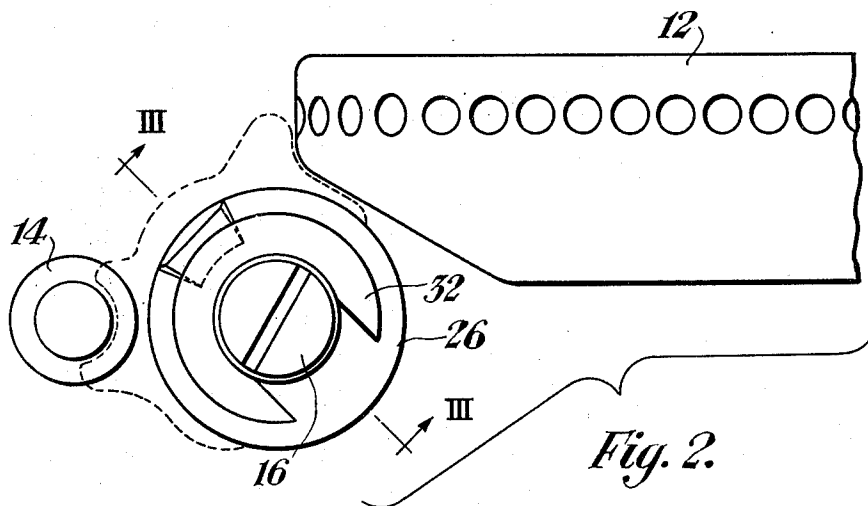
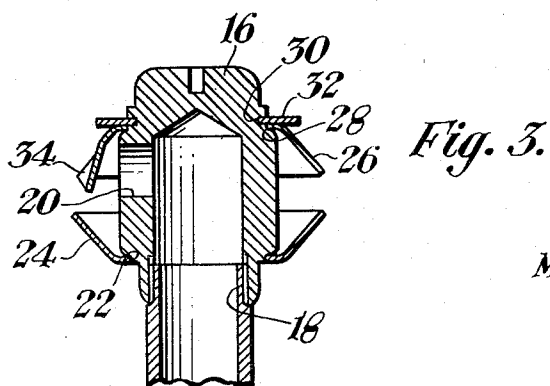


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AUTOMATIC PILOT BURNER  
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## UNITED STATES PATENT OFFICE

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## AUTOMATIC PILOT BURNER

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3 Claims. (Cl. 158—115)

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This invention relates to fuel burners and, more particularly, to an automatic pilot for controlling a main burner.

A conventional form of automatic pilot consists of a pilot burner located in heating proximity to a thermal control element and in lighting proximity to a main burner. Upon extinction of the pilot flame, the control element cools and serves to shut-off the flow of fuel to the main burner. Such pilot burners are provided with two or more burner ports for separately performing the heating and lighting functions described.

Generally, in such devices a series of smaller ports is located between the two burner ports to provide a flame for re-ignition should either the lighting or heating flame become extinguished accidentally. It is apparent, however, that should the lighter flame become extinguished due to clogging of the lighter port, no re-ignition could occur. Consequently, the heating flame would continue to heat the thermal control element in the absence of any means to ignite the main burner fuel. This creates obviously dangerous conditions and defeats the purpose of the automatic pilot.

An object of this invention is to prevent heating of the thermal control element in the absence of a flame for lighting the main burner.

Another object of the invention is to utilize a simple construction of pilot burner for accomplishing simultaneously the separate heating and lighting functions.

Another object of the invention is to insure production of either of both lighting and heating flames of adequate size or a simultaneous reduction to ineffectiveness.

Another object of the invention is to render the device usable with either aerated or non-aerated pilot burners.

Another object of the invention is to afford protection for the flames against extinguishment from drafts.

Another object of the invention is to simplify dismantling of the parts for cleaning of the burner ports.

Other objects and advantages will become apparent from the following description taken in connection with the accompanying drawing wherein:

Fig. 1 is a plan view of the automatic pilot in position at the main burner.

Fig. 2 is an elevation of the structure shown in Fig. 1 and

Fig. 3 is a cross-section taken on the line III—III of Fig. 2.

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Referring more particularly to the drawings, a fuel supply pipe 10 for a pilot burner is positioned adjacent a main burner 12 and a thermally responsive control element 14. In the present embodiment, the thermally responsive control element 14 takes the form of a thermoelectric device which is adapted when sufficiently heated to generate electric current for causing operation of an electromagnetic device (not shown) controlling the supply of fuel to the main burner 12.

The pilot burner of this invention comprises a cup-shaped head member 16 having its open end interiorly threaded for engagement with a threaded end 18 on the supply pipe 10. A single lateral port 20 is positioned in the wall of the head member 16 adjacent the closed end thereof and provides communication between the supply pipe 10 and the exterior of the head member 16. The threaded end 18 of the head member 16 is reduced in diameter on its exterior surface for defining an annular shoulder 22 on one side of the port 20. Positioned on the shoulder 22 is an annular hood element 24 which is dish-shaped to locate the outer edge thereof closely adjacent the port 20. As is apparent from Figs. 1 and 3, the hood element 24 does not overlap any portion of the port 20 and may be permanently secured in position on the shoulder 22 by swaging, welding or any other suitable method.

A second annular hood element 26 is positioned on the head member 16 on the opposite side of the port 20 from the first mentioned hood element 24. The second hood element 26 is also dish-shaped to locate the outer edge thereof in overlying relation with the port 20. A convenient means of supporting the second hood element 26 in position comprises a reduced portion formed on the closed end of the head member 16 and defining an annular shoulder 28 upon which the second hood element 26 is seated with the closed end of the head member 16 projecting there-through. In order to removably secure the second hood element 26 in position, an annular recess 30 is formed in the closed end of the head member 16 and spaced approximately the thickness of the second hood element 26 from the shoulder 28. The recess 30 provides for the reception of a C-washer 32 which is inserted by a transverse slidable movement relative to the head member 16. Consequently, when the washer 32 is in position, the hood element 26 is firmly retained upon the shoulder 28.

The second hood element 26 is provided with a depressed portion 34 which projects toward

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the first hood element 24 and overlaps the port 20. Sufficient space is allowed between the exterior opening of the port 20 and the depressed portion 34 to permit exit of fuel from the supply pipe 18, although the velocity of such fuel is somewhat reduced. The depressed portion 34 interrupts the contour of the second hood element 26 for a distance substantially equal to the diameter of the port 20 and is so formed for a purpose which will be apparent hereinafter. As will be apparent from the drawing, the annular hood elements 24, 26, can be expeditiously manufactured from sheet material, such as metal, by stamping or otherwise forming the particular shapes described.

In the operation of the device, the fuel issuing from the port 20 is ignited by any suitable means to produce a single flame. However, as indicated by the broken lines in Fig. 2, this flame is divided into two peaks by reason of the depressed portion 34. One of these peaks extends on either side of the depressed portion 34 and serves to light the main burner 12 and heat the control element 14, respectively. As is further apparent from Fig. 2 of the drawing, the flame at the burner port 20 is fan-shaped due to the dish construction of the hood elements 24, 26, and the particular spacing thereof relative to the port 20.

The single flame produced at the port 20 may, of course, become clogged after a period of use, but in such event the two peaks of this flame will be reduced to ineffective size or extinguished completely. Hence, the control element 14 is permitted to cool and shut-off the flow of fuel from the main burner 12 before a dangerous condition can exist. The construction of the head member and hood elements 24, 26 provides protection from drafts for the burner port 20 and also provides means for the retention of the flame by reducing the velocity of the gas at the edge of the hood elements where the burning of the fuel begins. The type of flame desired can be produced by this device in either the aerated or non-aerated type of pilot burner.

Should the port 20 require cleaning, it is a matter of moments to withdraw the C-washer 32 and remove the second annular hood element 26 from its location on the shoulder 28.

Various changes may be made in the details of construction and arrangement of parts without departing from the scope of the invention as defined in the appended claims.

I claim:

1. A fuel burner comprising a hollow head member having a lateral port therein, a pair of annular hood elements having their outer peripheral edges disposed on opposite sides of said port in proximate and substantially parallel relation for producing a fan-shaped flame at said

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port, one of said elements having a portion of its said peripheral edge projecting more closely toward the other said element and interrupting the contour of said one element for a distance not less than the diameter of said port, said projecting portion being positioned in overlying relation with said port and forming a baffle for defining at least one peak in the flame on either side of said projecting portion.

2. A fuel burner comprising a cup-shaped head member having a lateral port adjacent the closed end thereof, a reduced portion on said closed end defining an annular shoulder thereon, an annular hood element supported on said shoulder with said reduced portion projecting there-through, said projecting reduced portion having an annular recess therein overlying said hood element, and a C-washer engageable with said head by transverse slidable movement in said recess for retaining said hood element on position on said shoulder.

3. A fuel burner comprising a cup-shaped head member having a lateral port adjacent the closed end thereof, an annular hood element supported adjacent the open end of said head on one side of said port, a second annular hood element supported on said head on the opposite side of said port and with said closed end projecting there-through, said hood elements having their outer peripheral edges in proximate and substantially parallel relation with each other for producing a fan-shaped flame at said port, said second hood element having a portion of its said peripheral edge projecting more closely toward the first said element and interrupting the contour of said second hood element for a distance substantially equal to the diameter of said port, said projecting portion being positioned in overlying relation with said port and forming a baffle for defining at least one peak in the flame on either side of said projecting portion, and a C-washer engageable with said head by transverse slidable movement only relative thereto for retaining said second hood element in position thereon.

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