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THERMO-GENERATOR AND PILOT BURNER ASSEMBLY

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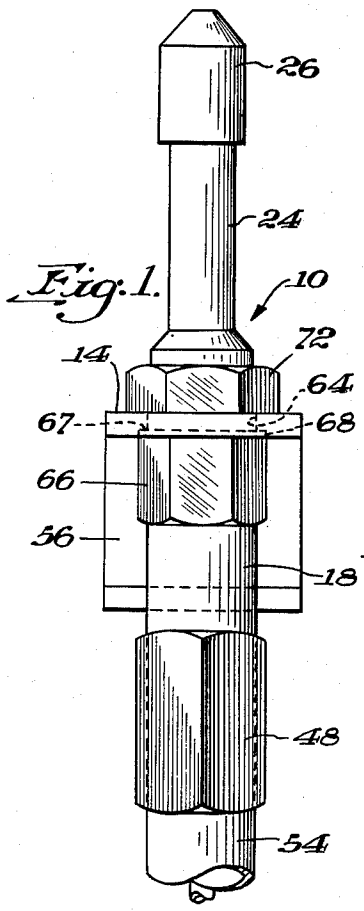



Fig. 1.

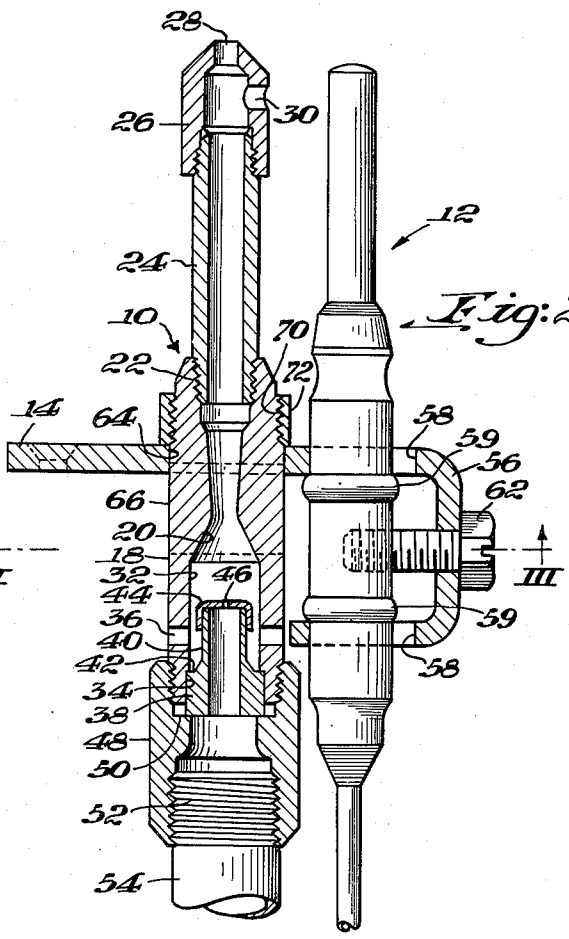



Fig. 2.

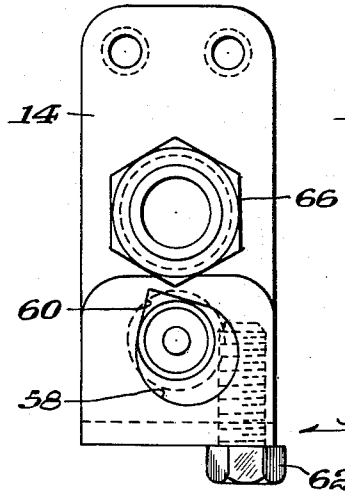



Fig. 4.

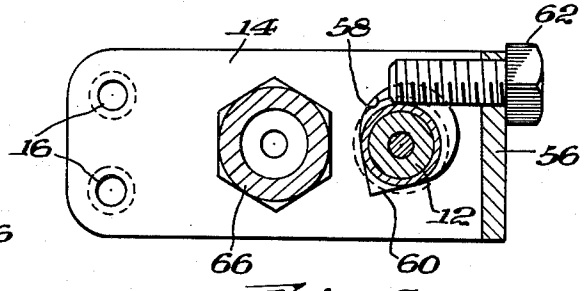



Fig. 3.

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## THERMOGENERATOR AND PILOT BURNER ASSEMBLY

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3 Claims. (Cl. 136—4)

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This invention relates to automatic pilot burner devices comprising a gas pilot burner which heats a thermoelectric element assembled in a common mounting bracket.

An object of the invention is to facilitate assembly of the pilot burner and thermal element in correct relative positions without special skill or the use of special tools or other equipment.

Another object of the invention is to render the pilot burner component readily available for use with different types of gaseous fuel.

Another object of the invention is to simplify the manufacturing operations and the cost of producing the pilot burner component.

Another object of the invention is to permit selective removal of either the pilot burner or the thermoelectric element from the common mounting bracket without interference with the other.

Another object of the invention is to eliminate flash back ignition of the pilot burner component.

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

Fig. 1 is a front elevation of the automatic pilot burner device.

Fig. 2 is a side-elevation partly in section of the device shown in Fig. 1.

Fig. 3 is a section taken on the line III—III of Fig. 2 and;

Fig. 4 is a plan view of the pilot burner device.

Referring more particularly to the drawing, the automatic pilot burner device is shown as comprising a pilot burner component 10 and a thermoelectric element 12 adapted to be mounted in substantially parallel relation on a bracket 14. The bracket 14 is provided with a pair of apertures 16 by which it may be mounted upon a main burner (not shown) and the pilot burner component 10 is adapted to both heat and thermocouple 12 and also ignite the main burner as will hereinafter be apparent.

The pilot burner component 10 includes a tubular body element 18 having a Venturi portion 20 intermediate its ends as is customary in such constructions. The smaller end of the Venturi portion 20 communicates with a threaded recess 22 formed in the tubular body element 18 for the reception of an extension tube 24 which is suitably threaded at one end for this purpose. The opposite end of the extension 24 is likewise threaded for the reception of a hollow burner tip 26 having an axial port 28 and a communicating lateral port 30.

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As previously indicated, the tubular body element 18 including the extension portion 24 is adapted to convey a gas-air mixture to the burner tip 26 for the production of a flame at the ports 28 and 30. When the device is properly positioned on a range or other fuel burning device, the flame issuing from the port 28 is adapted to ignite a main burner while the flame at the port 30 is adapted to heat the hot junction of the thermoelectric element 12. The tubular body element 18 is provided with an internal enlargement 32 therein which communicates at one end with the larger end of the Venturi portion 20 and has at the opposite end an enlarged opening 32 provided with an annular recess 34 and a plurality of ports 36 extending laterally through the wall of the tubular element 18 adjacent the recess 34.

A spud 38 of substantially cylindrical form and having an axial gas passage therethrough is positioned in the recess 34 in closely fitting relationship therewith. A reduced end 40 is formed on the spud 38 and provides a shoulder 42 intermediate the ends thereof which is adapted to be seated against the bottom of the recess 34. The reduced end 40 is spaced from the inner wall of the enlarged opening 32 to form an annular passage opposite the ports 36 through which primary air is adapted to enter the tubular element 18.

The axial passage in the spud 38 is provided with a restricted outlet opening which departs from the conventional form. In this embodiment, the spud 38 is provided with a cup-shaped element 44 of sheet material forming a cap for the reduced end 40 and having a restricted orifice 46 of desired size formed therein. The orifice cap 44 can be made of a disc of any suitable material and preferably is of non-corrosive metal, such as stainless steel. It will be apparent that such caps 44 are readily manufactured and can be replaced on the spud 38 with ease. Moreover, the spud 38 can be made of less expensive material without sacrificing the advantages of non-corrosive material at the orifice proper.

The outer wall of the tubular element 18 opposite the recess 34 is threaded for the reception of adjustable means for retaining the spud 38 in position. As shown, this adjustable means takes the form of a hollow threaded member or nut 48 having an internal shoulder 50 engageable with the end face of the spud 38 for the purpose described. In addition the nut 48 is provided with connecting means in the form of a hollow threaded end 52 for connection with a pilot supply pipe 54 for a source of gas supply.

As previously noted, the pilot burner component 10 constructed as described is assembled in the common mounting bracket 14 with the thermoelectric element 12. The bracket 14 is provided with a hooked end 56 having a pair of substantially aligned apertures 58 therein through which clearance is provided for the usual annular collars 59 formed on the thermoelectric element 12. As shown more clearly in Figs. 3 and 4, the apertures 58 are non-circular and specifically are best described as substantially of heart-shaped form. Such shape provides a V notch 60 in each of the apertures 58 and within which the tubular type thermoelectric element 12 is adapted to be secured. Such securing means takes the form of a threaded element or set screw 62 which extends through the hooked end of the bracket 14 intermediate the apertures 58 therein and transversely of the thermoelectric element 12 when in position. The periphery of the set-screw 62 overlies the thermoelectric element 12 in proximate relation. Due to this construction, the thermoelectric element 12 is firmly retained in the V notch 60 until the set screw 62 is withdrawn from its overlying engagement.

The bracket 14 is provided with a third aperture 64 in spaced relation to the apertures 58 and for the reception of the tubular body element 18 of the pilot burner component 10. In order that this component may be secured in position on the bracket 14, the tubular body element 18 is provided with a polygonal portion 66 intermediate its ends and having an end face 67 which is adapted to seat within a complemental polygonal recess 68 formed in the underside of the bracket substantially concentric with the aperture 4. Securing means for the pilot burner component takes the form of a threaded portion 70 formed on the tubular element 18 beyond the polygonal portion 66 and having a lock nut 72 thereon engaging with the surface of the bracket 14 for retaining the end face 67 seated in the recess 68.

The thermoelectric element 12 can readily be assembled in the bracket 14 by inserting the portion having the annular collars 59 thereon through the lower aperture 58 and then by a lateral movement positioning the cylindrical portion in the V notch 60. The collars 59 being both within the hooked end 56 serve to prevent axial movement of the element 12. The set-screw 62 can then be adjusted to secure the thermoelectric element 12 in such position. The assembly of the pilot burner component 10 is likewise easily carried out by removal of the lock nut 72 and insertion of the component through the aperture 64 from the underside until engagement of the polygonal portion 66 with the recess 68 occurs. Replacement of the lock nut 72 will serve to retain the pilot burner component in fixed position and no adjustment is needed to insure heating of the hot junction of the thermoelectric element 12 by a flame produced at the lateral port 30 of the burner tip 26.

It will be apparent that the spud 38 can readily be replaced when desired by merely removing the nut 48 to provide access to the interior of the tubular element 18. Due to the arrangement shown, either the pilot burner component 10 or the thermoelectric element 12 can be removed separately from the bracket 14 without interference with the other. Moreover, the primary air intake at the ports 36 does not require adjustment and, due to the arrangement described and shown herein, there is no opportunity for the pilot flame to be ignited at the orifice through the air intake.



It will be apparent that many 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.

We claim:

1. In an automatic pilot burner device, the combination of a tubular element adapted to convey a gas-air mixture therethrough, a burner tip carried at one end of said element and having a port at which said mixture is adapted to produce a flame, a thermoelectric element adapted to be positioned in the path of said flame to be heated thereby, a bracket having a plurality of apertures therein and a hooked end containing a pair of said apertures spaced in substantial alignment, one of said elements being adapted to project through one of said apertures and the other said element being adapted to project through said pair of apertures, means engageable with said bracket for securing said one element in said one aperture, abutment means carried by said other element, said abutment means being adapted to pass through at least one of said pair of said apertures, and means engageable with said bracket for displacing said other element transversely of the axis of said pair of apertures to position said abutment means to be engageable with the internal faces of said hooked end.

2. An automatic pilot burner device as claimed in claim 1 wherein said last named means comprises a member movable tangentially of said other element.

3. An automatic pilot burner device as claimed in claim 2 wherein said member comprises a set screw threaded in said bracket and arranged to make peripheral contact with the periphery of said other element.

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