Nov. 26, 1935. A. A. KING 2,022,568

GAS BURNER

Filed April 27, 1935

Fig-1.

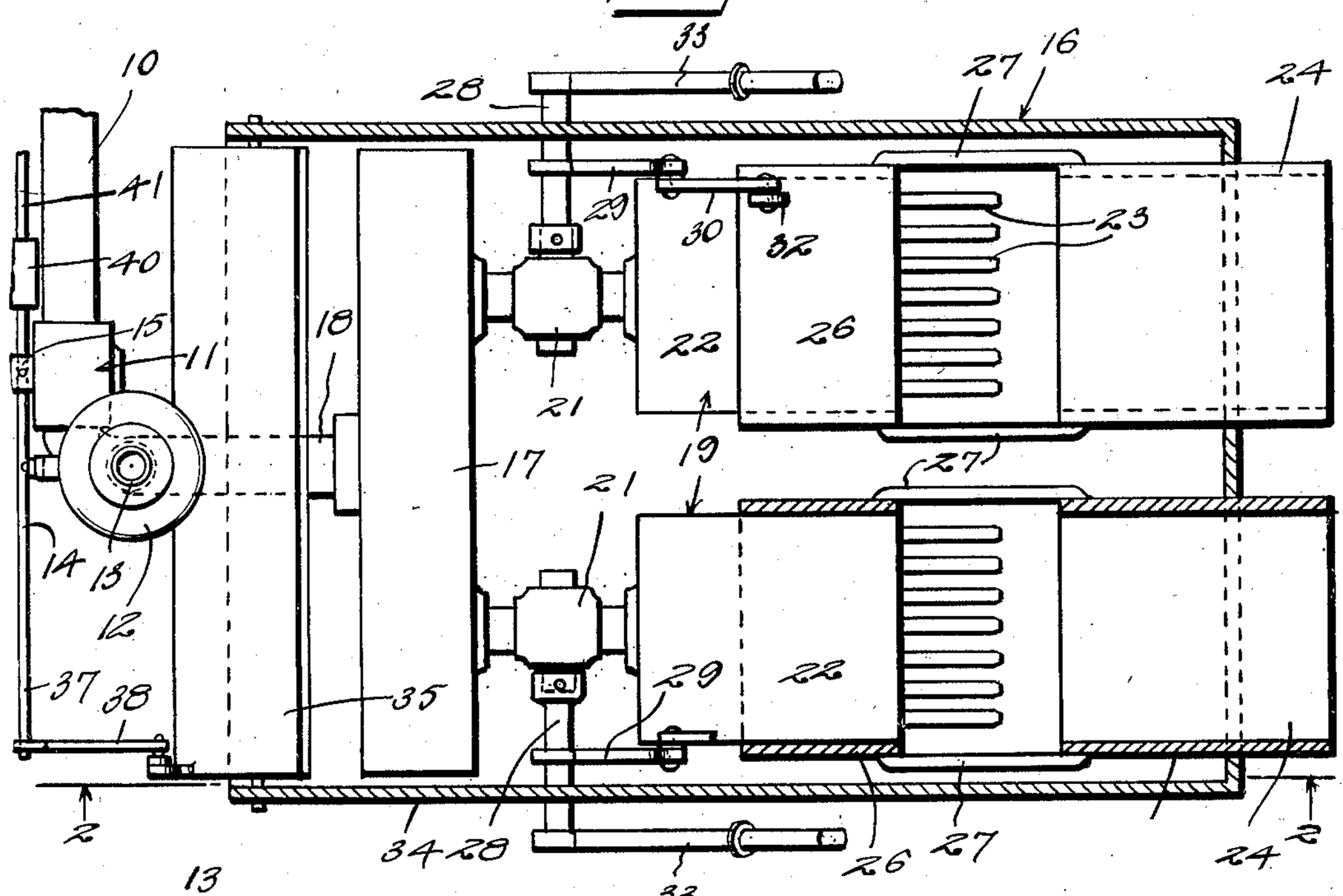


Fig-2.

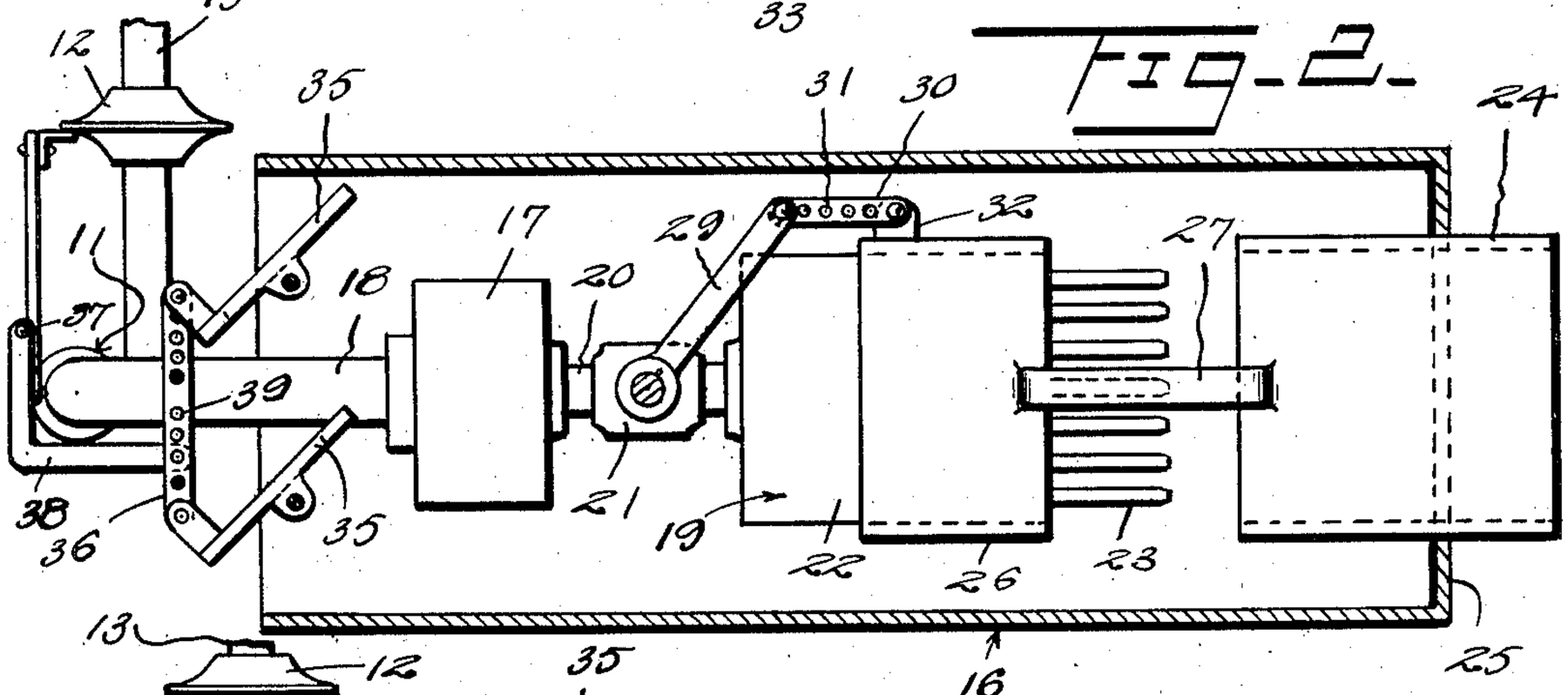
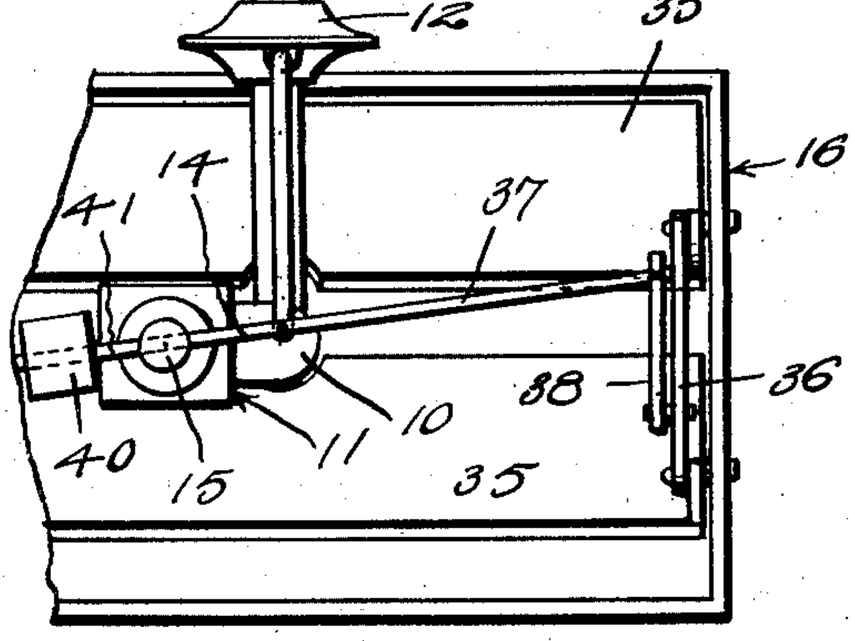


Fig-3.



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2,022,568

GAS BURNER

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5 Claims. (Cl. 158—119)

This invention relates to burners and more particularly to an improved type of gas burner for use with automatically controlled heating means.

An object of this invention is to provide an improved type of gas burner and means for controlling the mixture of air with the gas so as to automatically regulate the quantity of air dependent upon the quantity of gas.

A further object of this invention is to provide in an automatically controlled heating means, a gas burner and mixing means for automatically mixing air with the gas dependent upon the quantity of gas passing to the burner, the invention also comprehending the use of an adjustable means whereby the burner may be used in different localities where the pressure of gas varies.

A still further object of this invention is to provide a burner including means for coupling a plurality of jets to a manifold with each jet independently controlled so that one or more of the jets may be cut off without affecting the quantity of air entering the burner structure so that when it is desired to turn on the remaining jets it will not be necessary to readjust the air controlling means, as is the case with burners at present available.

The above and various other objects and advantages of this invention will in part be described in, and in part be understood from the following detail description of the present preferred embodiment, the same being illustrated in the accompanying drawing wherein:—

Figure 1 is a horizontal section taken substantially through the center of a device constructed according to an embodiment of this invention.

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

Figure 3 is a fragmentary front elevation of the device.

Referring to the drawing wherein like numerals of reference designate corresponding parts throughout the several views, the numeral **10** designates generally a gas supply line and the numeral **13** designates a pipe line connected to a furnace or heater structure. The gas line **10** has a valve shown diagrammatically at **11**, connected thereto and a thermostatic control means also diagrammatically shown at **12** is connected to the pipe line **13** and this control means **12** opens or closes the valve **11** by means of a lever **14** mounted on a valve stem or rock shaft **15**, associated with the valve **11**. The thermostatic control means **12** and the valve structure **11** and the associated parts are conventional and are here shown only diagrammatically, it being understood that the thermostatic means **12** may be of any suitable type used for opening and closing the valve **11**.

A box or housing **16** has a manifold **17** disposed therein and adjacent the forward end thereof which is connected to the valve **11** by means of a pipe **18**. This manifold **17** has a gas nozzle structure **19** connected thereto by means of a pipe **20** and a cut-off valve or control means **21** is interposed in the pipe **20** between the nozzle structure **19** and the manifold **17**. If desired, there may be two or more of these gas ejecting members **19** within the housing **16** and each of the gas ejecting members may be connected to the manifold **17** so that the pressure of gas at the ends of the nozzles will be the same in each case.

The gas nozzle structure comprises a housing **22** preferably cylindrical in construction and provided with a plurality of forwardly extending nozzle members **23**. A cylindrical mixing member **24** is slidable through the inner wall **25** of the housing **16** and is connected to a cylindrical guide member **26** slidable on the housing **22** by means of a pair of arms **27** so that the mixing member **24** will be disposed in forwardly spaced relation to the housing **22**.

The valve **21** has a valve stem **28** to which is secured a lever **29** and this lever **29** is connected to the slidable guide member **26** by means of a link **30** provided with a plurality of spaced apart holes **31** so that the guide member **26** may be adjusted to the desired position along the length of the support or housing **22**.

The link **30** is connected as by lugs **32** to the guide member **26**. A lever **33** is secured to the end of the stem **28** which projects through the side wall **34** of the housing **16** and rocking of this lever **33** will not only adjust the opening in the valve **21** but will also adjust the mixing chamber **24** relative to the nozzles **23**.

The outer end of the housing **16** is preferably open and shutters or air valve members **35** are rockably secured to the side walls **34** and control the opening in the outer end of the housing **16** so as to regulate the quantity of air passing through the housing. In the present instance, there are shown two shutters or valve members **35** connected together as by a link **36** so that these shutters are open or closed as a unit.

The opening or closing of the shutters **35** is automatically controlled by means of a rock lever **37** which, in the present instance, is connected to or made a part of the rock lever **14** and the rock lever **37** is connected by a link **38** to the link **36** which, as shown in the drawing, is provided with a plurality of spaced apart holes **39**. A weight or balancing member **40** is mounted on an arm **41** which may be integral with the two levers **14** and **37** but extending on the opposite side of the axis of the rock shaft **15**. In the use and operation of this device, the main valve connected to the gas supply line **10** is opened and when the heater to which the pipe **13** is connected is cold the valve **11** will be opened by the thermostatic means **12**.

Opening of the valve **11** will cause the rock

arm or lever 37 to be moved preferably in an upward direction so as to swing the shutters 35 into open position. The flame forwardly of the nozzles 23 is regulated by means of the lever 33 which may be adjustable so as to open or close the valve 21 to the desired degree depending upon the pressure of gas within the pipe 10. Adjustment of the lever 33 will also adjust the position of the mixing chamber 24 so that the desired quantity of air entering through the opened shutters 35 will mix in the chamber 24 with the gas ejected from the nozzles 23. If desired, one of the burners 19 may be cut off by swinging the associated lever 33 so as to close the valve 21 whereupon the gas will flow to the other of the burners. In this manner the quantity of heat will be lessened but the quantity of air entering the housing 16 will be the same as for the plurality of burners.

When more heat is desired, the remaining burners may be turned on but this action will not require any adjustment of the shutters 35 so as to regulate the air entering the housing 16. It will be apparent that an exceedingly simple burner structure has been disclosed which can be mounted in any furnace or boiler and connected to conventional thermostatic control means so that the thermostatic means will adequately control the combustion of the gas or fuel at all times.

It is, of course, understood that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

I claim:—

1. A gas burner comprising a housing open to the atmosphere at its outer end and provided with an inner end wall having an opening, jet means within the housing, a mixing member slidable through said opening and movable relative to said jet means, said mixing member simultaneously receiving gas from the jet means and air from the interior of the housing, means operable exteriorly of the housing for adjusting the mixing member relative to the jet means whereby to control the admission of air into the mixing member, a damper at the open end of the housing, a thermostatic means, and means for connecting the damper to the thermostatic means to thermostatically control the opening and closing of the damper.

2. A thermostatically controlled gas burner comprising a housing open to the atmosphere at its outer end and provided with an inner end wall having an opening, jet means within the housing, means for connecting the jet means to a source of gas supply, a mixing member slidable through said opening and movable relative to said jet means, said mixing member simultaneously receiving the gas from the jet means and air from the interior of the housing, means operable exteriorly of the housing for adjusting the mixing member relative to the jet means whereby to control the admission of air into the mixing member, a damper at the open end of the housing, a thermostatic means, and means for connecting the damper to the thermostatic means to thermostatically control the opening and closing of the damper.

3. A thermostatically controlled gas burner comprising a housing open to the atmosphere at its outer end and provided with an inner end wall having an opening, said housing being insertible in a furnace or boiler, jet means within the housing, a mixing member slidable through said opening and movable relative to said jet means, said mixing member simultaneously receiving gas from the jet means and air from the interior of the housing, means for connecting the jet means to a source of gas supply, a manually controllable valve in said connecting means, means connected to the valve and the mixing member to simultaneously adjust the member relative to the jet means while opening or closing the valve whereby to control the admission of air into the mixing member, a damper at the open end of the housing, a thermostatic means and means for connecting the damper to the thermostatic means to thermostatically control the opening and closing of the damper.

4. A thermostatically controlled gas burner comprising a housing adapted to be inserted in a furnace and provided with an open outer end and with an inner end wall having an opening, jet means within the housing, means for connecting the jet means to a source of gas supply, a valve in said connecting means, a mixing member slidable through said opening and movable relative to the jet means, said mixing member simultaneously receiving the gas from the jet means and air from the interior of the housing, manually operable means connected to the valve and the mixing member to simultaneously move the mixing member relative to the jet means while opening or closing the valve whereby to control the admission of air into the mixing member, a damper at the open end of the housing, a thermostatic means, a rock lever secured to said thermostatic means and means for connecting the lever with the damper to thermostatically control the opening and closing of the damper.

5. A thermostatically controlled gas burner comprising a housing adapted to be inserted in a furnace or boiler and provided with an outer end open to the atmosphere and an inner end wall having an opening, jet means within the housing, a manifold within the housing, means for connecting the manifold with the jet means, a valve interposed in said connecting means, a slide carried by said jet means, a mixing member open at each end disposed forwardly of the jet means and projecting through said opening, said mixing member receiving gas discharged by the jet means while simultaneously receiving air from the housing, means connecting the slide with the mixing member whereby to dispose the mixing member in forwardly spaced relation to the jet means, manually operable means connected to the valve and to the slide to manually control the position of the mixing member relative to the jet means while opening or closing the valve, movement of the mixing member relative to the jet means controlling the admission of air into the mixing member, means for connecting the manifold to a source of gas supply, a second valve in said latter connecting means, thermostatic means connected to the second valve, a damper at the open end of the housing and means connecting the damper with the second valve to swing the damper to opened or closed position coactive with the movement of the second valve to opened or closed position.

ALBERT A. KING.