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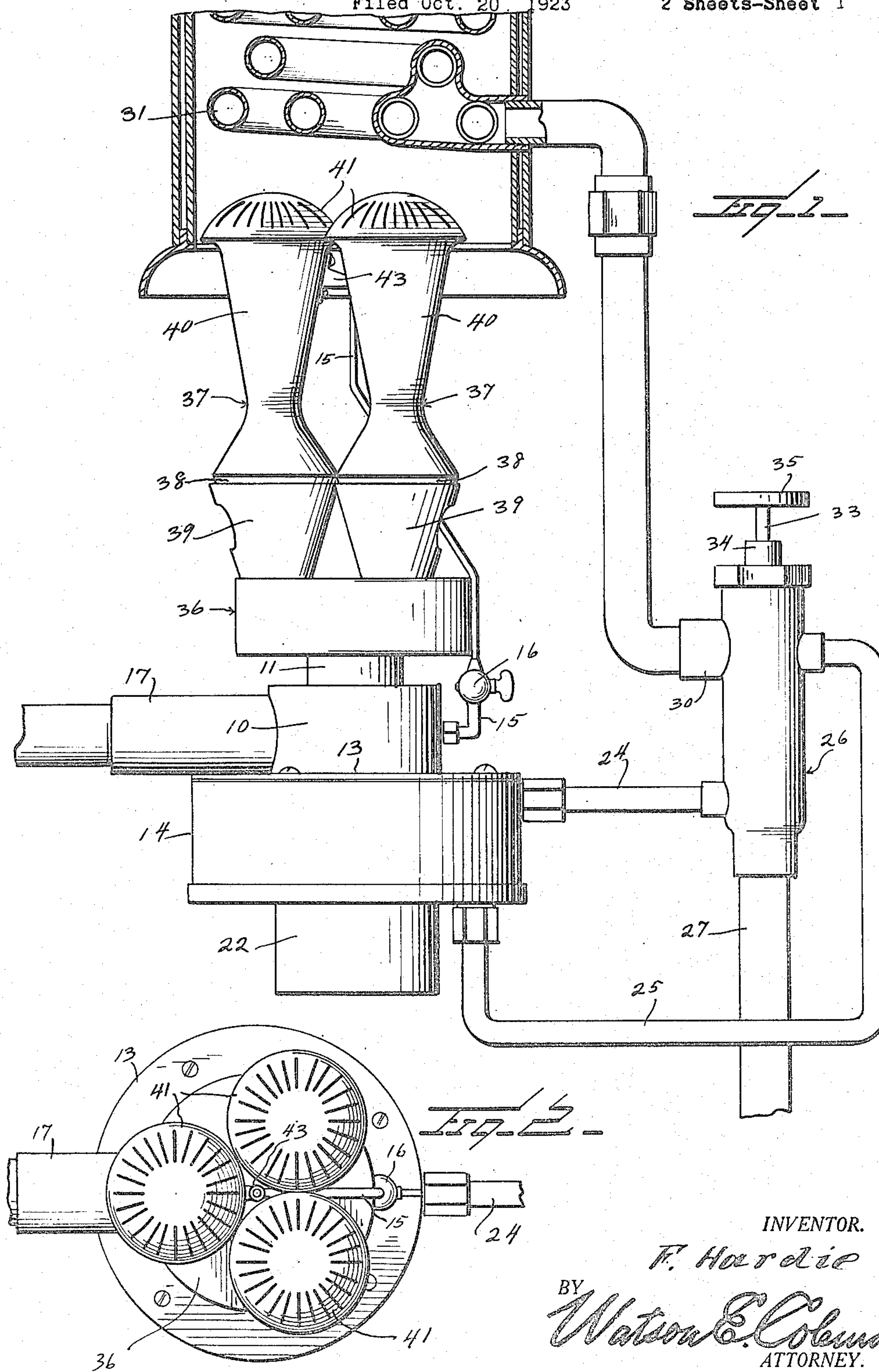
1,515,772

F. HARDIE

AUTOMATIC WATER HEATER

Filed Oct. 20, 1923

2 Sheets-Sheet 1



INVENTOR.

F. Hardie

BY

Watson E. Coleman
ATTORNEY.

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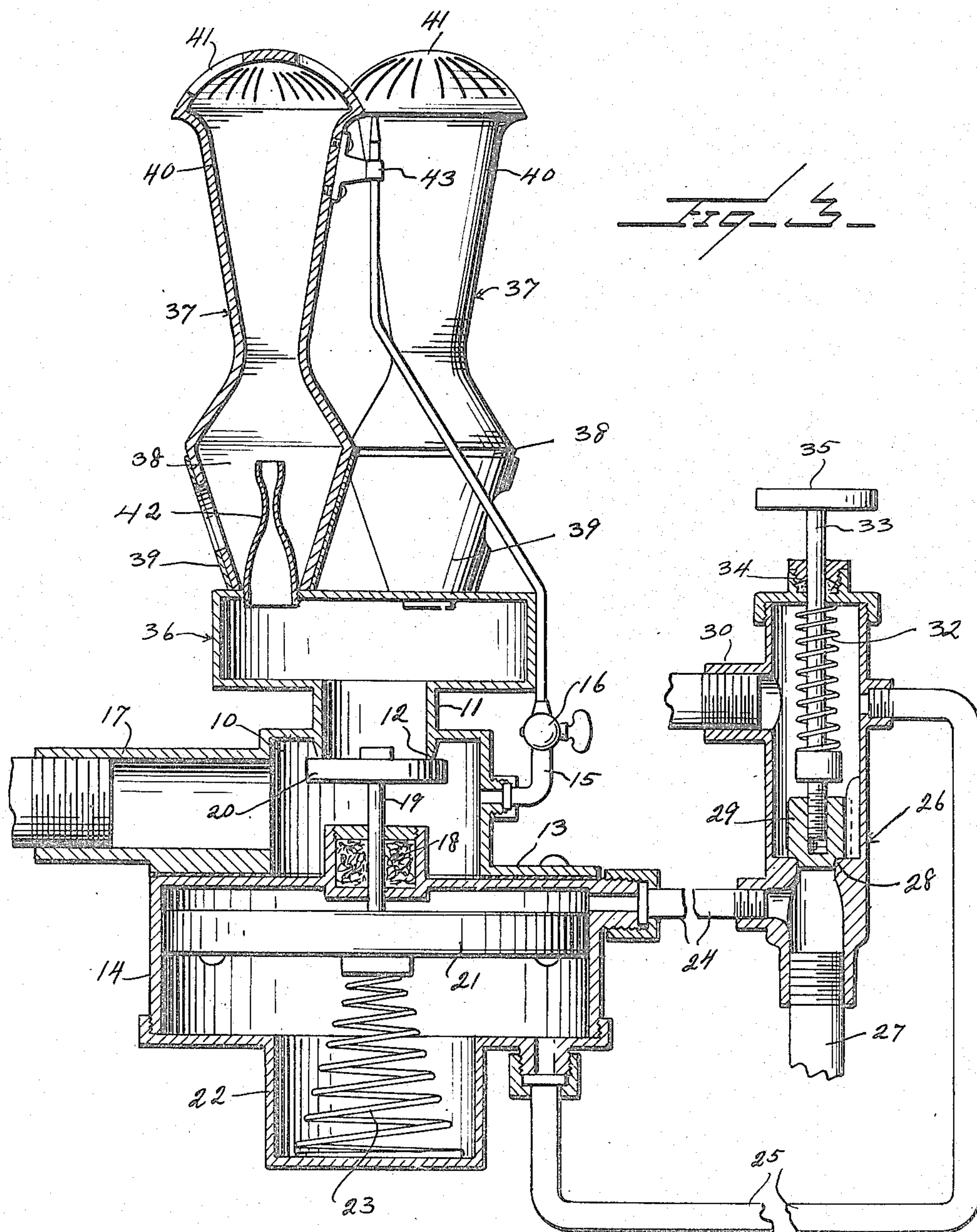
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2 Sheets-Sheet 2



INVENTOR.

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UNITED STATES PATENT OFFICE.

FRANK HARDIE, OF HAMMOND, INDIANA.

AUTOMATIC WATER HEATER.

Application filed October 20, 1923. Serial No. 669,821.

To all whom it may concern:

Be it known that I, FRANK HARDIE, a citizen of the United States, residing at Hammond, in the county of Lake and State of Indiana, have invented certain new and useful Improvements in Automatic Water Heaters, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to automatic water heaters and has for a particular object thereof the provision of a novel and efficient gas supply control valve.

An important object of the invention is to provide a gas supply control valve automatically actuated when water is turned on at the tap to supply gas to the burner for heating the water as it is drawn.

A further object of the invention is to provide apparatus of this character which is extremely simple in its construction and operation, durable in service and a general improvement in the art.

These and other objects I attain by the construction shown in the accompanying drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention and wherein:—

Figure 1 is a side elevation partially in section showing an automatic water heater constructed in accordance with my invention;

Figure 2 is a plan view of the burner mechanism; and

Figure 3 is a vertical sectional view through the automatic control and burner mechanism.

Referring now more particularly to the drawing, the numeral 10 indicates a gas supply chamber provided in its upper surface with a port 11, the inner end of which is provided with a valve seat 12. The lower wall of the chamber is vacated and the chamber is provided about its lower edge with a flange 13 by means of which it is attached to a regulator chamber 14. To one side wall of the chamber 10 a conduit 15 is connected having arranged therein a valve 16 by means of which the flow of gas may be controlled, this conduit providing for the pilot light usually in such heaters. The side wall of the chamber is further provided with a gas inlet 17.

The regulator chamber 14 is provided centrally of the upper surface thereof with a packing gland 18 through which extends

a valve stem 19 to the upper end of which is secured a valve 20 coacting with the seat 12 of the gas supply chamber. The lower end of the stem which extends within the regulator chamber has secured thereto a piston 21 having a snug fit with the walls of the chamber. The bottom wall of the regulator chamber is cupped, as indicated at 22, forming the seat for the lower end of a spring 23, the upper end of which abuts against the lower end of the stem 19 to constantly urge the same upwardly and place the valve 20 in engagement with the seat 12. With the upper end of the regulator chamber 14 a conduit 24 communicates, with the lower end thereof a second conduit 25, the purpose of these conduits appearing hereinafter.

The numeral 26 designates a water supply control valve consisting of a casing, one end of which is connected with the supply pipe 27. Adjacent this end the casing is provided with a valve seat 28 which coacts with a check valve 29. Between the valve seat 28 and the inlet end of the casing the conduit 24 communicates with the interior thereof. Adjacent its opposite end the casing is provided with an outlet 30 communicating with the spigots of the house water system, (not herein shown), through the heater coil 31 of the heater. This end of the casing has further communicating therewith one end of the conduit 25. The check valve 29 is spring-seated by a spring 32, the pressure of the spring being regulated by a stem 33 engaging with the valve and extending upwardly through a packing gland 34 at the upper end of the casing. The valve 29 is held against rotation in any suitable manner and, the end of the stem being threaded therein, the desired adjustment can be secured by operating the handle 35 with which the upper end of the stem is provided. The burner 36 comprises a burner base communicating with the outlet port 11 and having arranged upon its upper side burner structures 37, these burner structures 37 each including a tube having a base section 38 provided with an air inlet regulator 39 and an upper section 40 having a venturi-form central aperture. The upper end of the upper section 40 terminates in a cap 41 having radially disposed slots formed therein for the escape of the gas and air. In the upper surface of the burner plate are screw-threaded jet nozzles 42 which are each

venturi-form and each of which has its upper end disposed in approximate alignment with the upper end of the base sections 39 of the burner. The base portions of the jet nozzles are of such size that the lower ends of the base portions 39 of the burner proper fit snugly thereon so that these burners are held against movement with relation thereto. In this form of burner the gas is ejected into the venturi-form passage which causes the same to be thoroughly mixed with the air entering through the regulator 39 with the result that perfect combustion is provided at the caps 41, the mixed gas and air burning with a greenish blue flame. One of the burners 37 is preferably provided with a support 43 for the upper end pilot light conduit 15.

In the operation of the device it will be obvious that since the check valve 29 is spring-seated it will only be during that period of time that the supply of water is not in use that the pressure within the conduits 25 and 24 will be equal or so nearly equal that the spring 23 will move the piston 21 upwardly to close the valve 20 and shut off the supply of gas. Immediately upon opening of a nozzle the pressure is unbalanced, the pressure being materially reduced at the upper portion of the casing 26 and in the conduit 25. This overbalancing of the pressure causes the pressure entering through the supply pipe 27 and conduit 24 to force the piston downwardly against the action of the spring 23 and open the valve 20, permitting gas to flow to the burners where it will

be ignited by the pilot light. It will be obvious that the structure hereinbefore set forth is capable of some change and modification without in any manner departing from the spirit of my invention and I accordingly do not limit myself to such specific structure except as hereinafter claimed.

I claim:—

In combination, a gas burner, a gas chamber having an open side and provided in its opposite side with a port communicating with the gas burner, the inner end of the port forming a valve seat, a control cylinder secured to the gas chamber and having one end wall thereof closing the open side of the gas chamber, a piston within the cylinder having a stem directed through said wall of the control cylinder, a valve on the end of said stem and coacting with said valve seat, a spring normally maintaining said valve in engagement with said valve seat, a casing having an inlet and an outlet end and a spring-seated valve closing toward the inlet end thereof, the inlet end of the casing being in communication with a source of fluid supply, a connection between the inlet end of the casing and the cylinder between the piston and said end wall thereof, a connection between the outlet end of the casing and the opposite end of the cylinder, and means for controlling the pressure exerted upon the valve of the casing by the spring thereof.

In testimony whereof I hereunto affix my signature.

FRANK HARDIE.