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R. R. ROOT

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GAS CONTROLLING DEVICE

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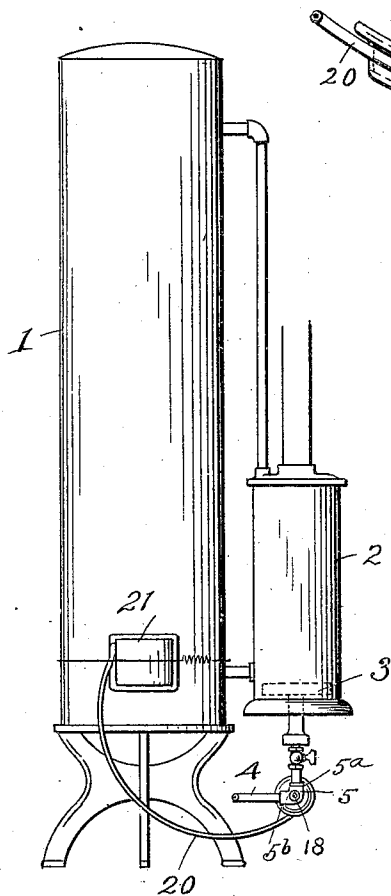


Fig. 1.

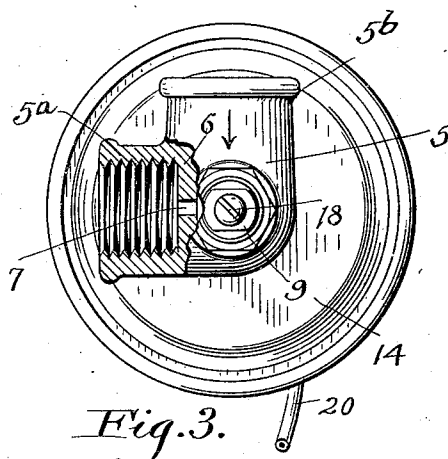


Fig. 3.

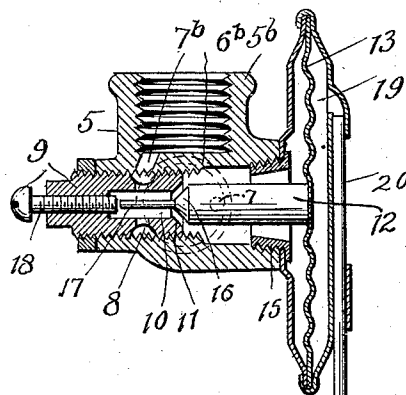


Fig. 2.

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GAS-CONTROLLING DEVICE

Application filed February 8, 1926. Serial No. 86,775.

This invention relates to an apparatus for controlling the flow of gas to a burner which is utilized to heat water primarily, although the invention is obviously not limited to the matter of heating water.

The object of the invention is to provide a device which is sensitive and which will consistently and reliably perform its function in controlling gas.

A further object of the invention is controlling the function of the valve by means of a gas operated thermostat.

Reference should be had to the accompanying drawing forming a part of this specification in which Fig. 1 is an elevation of a domestic water heating tank with the invention herein described applied thereto; Fig. 2 is a sectional elevation of a valve and diaphragm controlling movement of the valve; Fig. 3 is a side elevation with portions in section of the device; Fig. 4 is a top plan view with portions in section of a portion of the thermostat part of the device.

In the specification describing the invention, the use of the invention as applied to the control of the heating of water used in a domestic water heating outfit will be described as one of the embodiments which the present invention may assume.

Referring to the drawing, 1 indicates the usual boiler used in houses for storing hot water, 2 is a water heater of any desired type. This water heater is suitably connected with the boiler and functions in the heating of water in a manner well known to those familiar with this art. The gas burner, which is indicated at 3, used in the heating device is supplied with gas from a pipe line 4.

The apparatus for controlling the functioning of the gas burner 3 comprises an elbow-like casing 5 having an extension 5^a and an extension 5^b. This device is made in this particular form so that it may be conveniently fitted into the gas supply line, the gas supply line being a standard construction where the gas pipe is usually brought beneath the heating device, and an elbow inserted in the line so that gas may be brought vertically to the underside of the heater. The extensions 5^a and 5^b are threaded so as to

be capable of being joined to the gas pipe. Within the body of the casing 5 there are walls 6 and 6^b which close the inner ends of the openings in the extensions 5^a and 5^b except for openings 7 and 7^b respectively. Co-operating with the opening 7^b there is a groove 8 which is formed in a threaded plug 9, this plug 9 occupying a threaded opening of the casing 5. The plug is recessed, as indicated at 10, and at the inner end of the recess there is a seat 11 with which the valve co-operates, which will be later described.

The extension 5^a is open and unobstructed, and communication between the interior of extension 5^a and the interior of extension 5^b is had through the recess 10 in the plug 9 and the openings 7 and 7^b in the walls 6 and 6^b which communication is controlled by a valve, as will be described.

A valve member 12 is mounted upon a flexible diaphragm 13, this diaphragm being held at its periphery between two sections of a casing 14. This casing is connected in a gas tight way with the casing 5, in this instance the conical threaded member 15 serving for this purpose. The valve 12 at its end is provided with a conical portion 16 which co-operates with the conical seat 11. It is evident that the operation of the diaphragm 13 will control the movement of the valve 12.

The valve 12 is formed with a pin extension 17 which may engage with a threaded member 18. The threaded member 18 may be screwed inwardly so as to engage with the end of the pin 17 where such is desired and so permanently prevent the valve from coming entirely to its seat. In other words, by manipulating the screw 18 it is possible to hold the valve open to a slight degree and permit enough gas to always pass so that the burner will be supplied with a small amount of gas desired. Under such circumstances the operation of the burner will be controlled by supplying anywhere from a minimum amount of gas to the full gas supply.

Such a construction is in many respects preferable to a pilot and therefore provision is made for the same, however, such operation of the valve is not essential.

The casing 14 is a gas-tight casing and the chamber 19 which is on one side of the diaphragm 13 is connected in a gas-tight manner with a pipe 20. The pipe 20 communicates with a flat casing 21. This casing in its thickness or height is quite small when compared with its length and breadth therefore providing an interior chamber which is of considerable superficial area but of comparatively small height. The interior surface of this casing may be curved, if desired, in order to fit the water tank or other device to which it is applied.

The pipe 20 is preferably made of flexible copper so it may be bent, thereby permitting the member 21 to be applied to any device which it is desired.

The interior of the casing 21 and the chamber 19 of the casing 14 are filled with a gas, such as air, which because of the relatively large volume of air which is employed is sensitive and responsive to temperature changes.

The casing 21 is made of small depth in order to bring the gas inside the casing 21 into ultimate relationship with the object which is radiating heat. However, the length and breadth of the casing 21 are made of such dimensions as to give a relatively large body of gas in the casing 21 which being subject to temperature changes in the water tank will work corresponding movement of the diaphragm 13 either to move the valve to closed position or to move the valve to open position.

Having described my invention, I claim:

1. An apparatus adapted to be used with a water heater for controlling the flow of gas therethrough comprising an elbow-like casing adapted to have secured thereto and at right angles to each other a gas conduit and a conduit leading to said heater, said casing having a centrally disposed opening therethrough arranged to extend transversely of both of said conduits, a plug arranged in said opening and recessed adjacent one end, a passage in said casing and said plug connecting the conduits through the recess in said plug, a valve in said casing adapted to close said recess, a second casing secured to said first named casing adjacent to one end of the opening therein, said second named casing being divided into two chambers by a flexible diaphragm connected to said valve, a third casing adapted to contain a gas and to be secured upon the device containing the medium to be heated and a tube connecting said second named and third named casings whereby when the gas contained within said last named casing becomes heated and expands the flexible diaphragm in said second named casing will be moved to actuate the valve to close the recess in the plug.

2. An apparatus adapted to be used with a water heater for controlling the flow of gas therethrough comprising a casing adapt-

ed to have secured thereto and at right angles to each other a gas conduit and a conduit leading to said heater, said casing having a centrally disposed opening therethrough arranged to extend transversely of both of said conduits, a plug arranged in said opening and recessed adjacent one end, a passage in said casing and said plug connecting the conduits through the recess in said plug, a valve in said casing adapted to close said recess, adjustable means carried by said plug for limiting closing movement of said valve, a second casing secured to said first named casing adjacent to one end of the opening therein, said second named casing being divided into two chambers by a flexible diaphragm connected to said valve, a third casing adapted to contain a gas and to be secured upon the device containing the medium to be heated, and a tube connecting said second named and third named casings, whereby when the gas contained within said last named casing becomes heated and expands the flexible diaphragm in said second named casing will be moved to actuate the valve to close the recess in the plug.

In testimony whereof, I hereunto affix my signature.

RALPH R. ROOT.