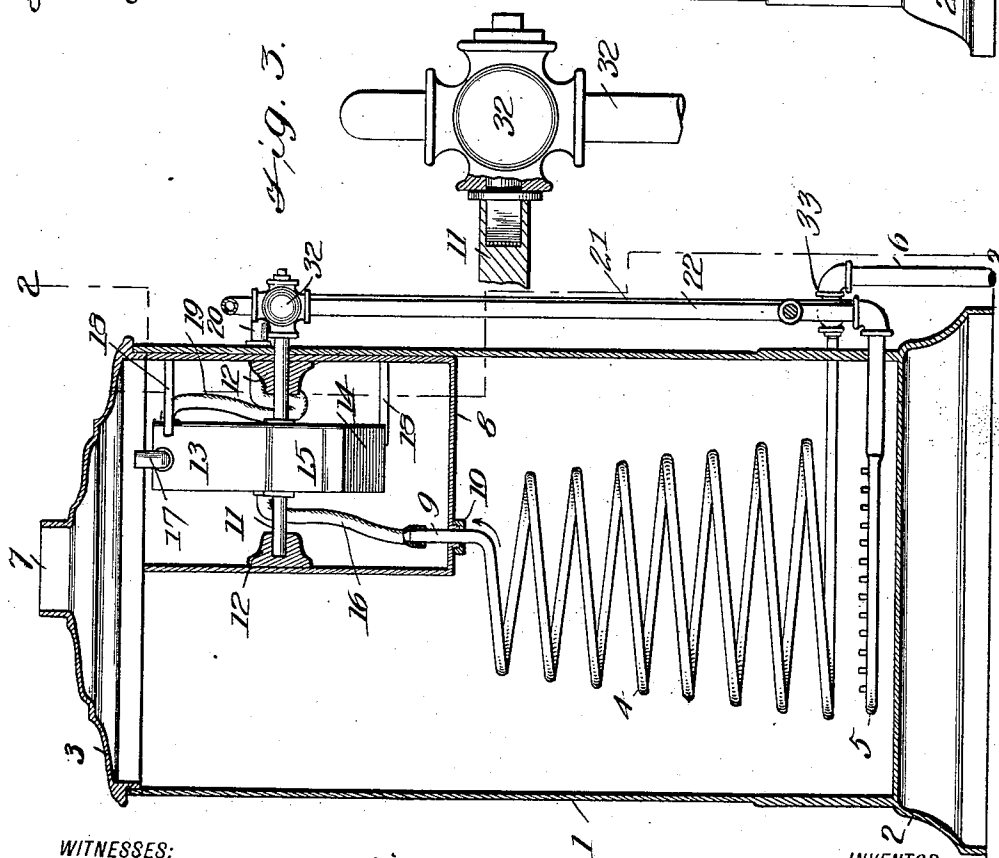
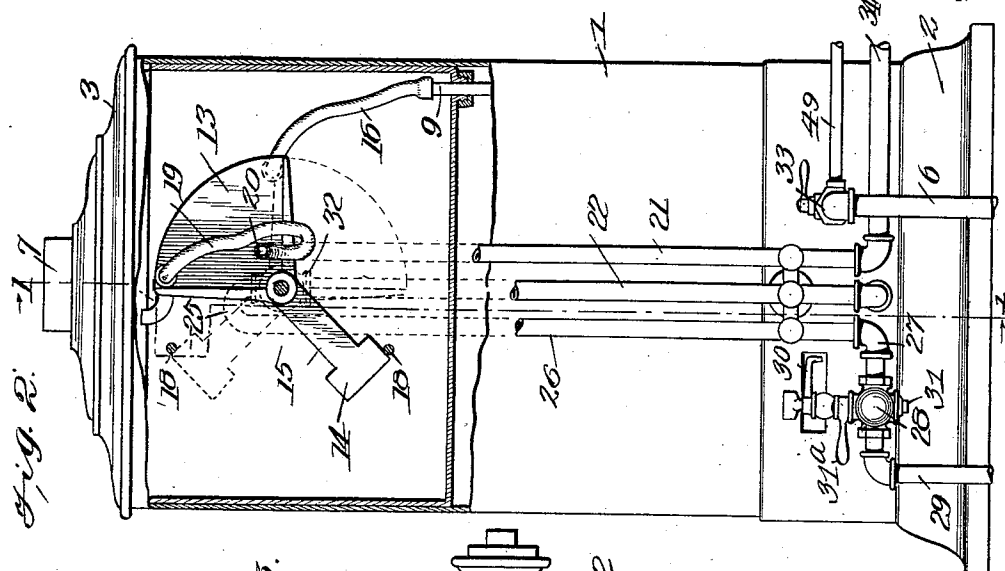


S. I. SHAND.
 AUTOMATIC GAS AND DRAIN VALVE.
 APPLICATION FILED JULY 7, 1910.

1,016,100.

Patented Jan. 30, 1912.

2 SHEETS—SHEET 1.



WITNESSES:
H. Bang
C. E. Snider

Fig. 1.

INVENTOR
STEAD I. SHAND
 BY *Munn & Co.*

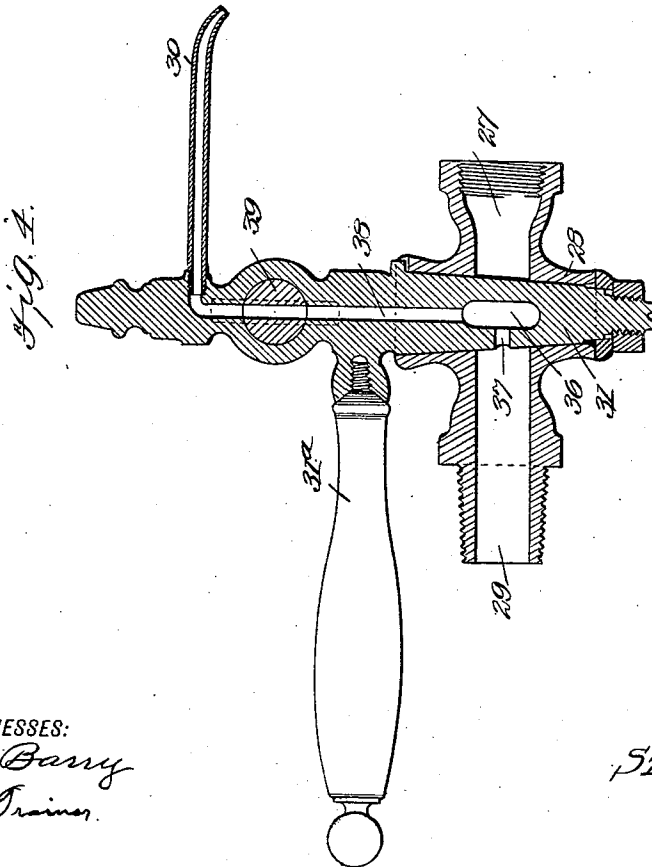
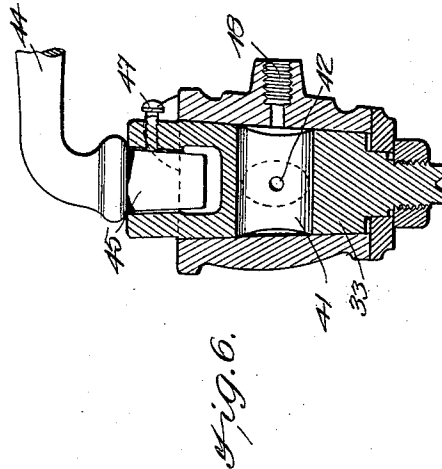
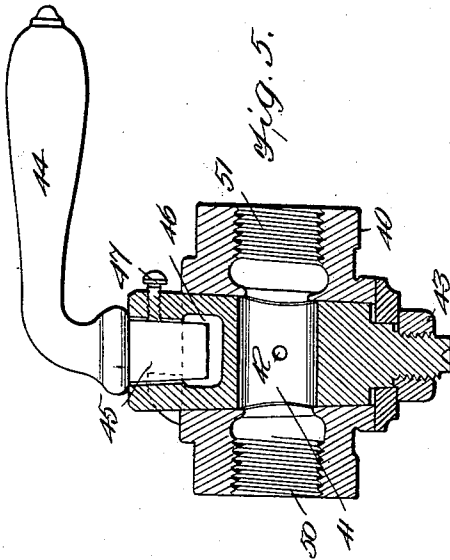
ATTORNEYS

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2 SHEETS—SHEET 2.



WITNESSES:
J. E. Barry
C. E. Trimmer

INVENTOR
STEAD I. SHAND
 BY *Munn & Co.*
 ATTORNEYS

UNITED STATES PATENT OFFICE.

STEAD I. SHAND, OF COLUMBIA, SOUTH CAROLINA.

AUTOMATIC GAS AND DRAIN VALVE.

1,016,100.

Specification of Letters Patent.

Patented Jan. 30, 1912.

Application filed July 7, 1910. Serial No. 570,826.

To all whom it may concern:

Be it known that I, STEAD I. SHAND, a citizen of the United States, residing at Columbia, in the county of Richland and State of South Carolina, have invented a new and useful Improvement in Automatic Gas and Drain Valves, of which the following is a specification.

My invention is an improvement in automatic gas and drain valves, and consists in certain novel constructions, and combinations of parts, hereinafter described and claimed.

The object of the invention is to provide a mechanism, for use with instantaneous water heaters, to prevent injury to the coils by overheating when empty, or by freezing when full by means of which it will be impossible to apply heat until the coils are filled, or to shut off the water without draining the coils.

Referring to the drawings forming a part hereof, Figure 1 is a section on the line 1—1 of Fig. 2, Fig. 2 is a section on the line 2—2 of Fig. 1, Fig. 3 is an enlarged side view of the valve, Fig. 4 is a vertical section of the pilot burner and the valve controlling the same, Fig. 5 is a similar view of the three way valve, and Fig. 6 is a similar view at right angles to Fig. 5.

In the present embodiment of the invention, the heater, which may be of any usual or desired construction, consists of a casing 1, having a base 2, and a cover 3, and a water coil 4 is arranged in the casing, above a burner 5 of usual construction. The coil is connected at its lower end with a supply pipe 6, from a suitable source of water under pressure, and the cover 3 is provided with a flue opening 7. A casing 8 is arranged in the upper end of the heater, the said casing extending approximately half across the heater, and the upper end of the coil 4 opens into the casing at 9, being encircled by a packing nut 10. The casing is open at its top, and a shaft 11 is journaled in bearings 12 transversely in the casing. A box 13 segmental in form is secured to the shaft at approximately the center thereof, and the box is counterbalanced by a weight 14, on an arm 15 secured to the shaft, and extending radially therefrom. A flexible pipe or hose 16 connects the end 9 of the coil with the box, and the box is also provided with an air vent 17. The weight normally holds the box in the position shown

in Fig. 1, and stops 18 are provided for limiting the movement of the box, the stops being arranged, one above and one below the arm 15. When the box is filled with water, rising through the coil, the weight is overbalanced, and the box moves into the dotted line position of Fig. 2. A hose 19 leads from the box to a nipple 20 passing through the wall of the heater, and a pipe 21 leads from the nipple downwardly in front of the heater to a connection with a discharge pipe 34. The burner 5 is supplied with gas from a pipe 22, which leads upwardly along the front of the heater and is connected by an elbow 25 with a pipe 26 leading downwardly on the front of the heater, and connected by an elbow 27 with a valve casing 28. The casing 28 is connected with a pipe 29 leading from a suitable source of gas supply.

An auxiliary or pilot burner 30 is arranged adjacent to the burner 5 for lighting the same, and a valve 31 in the casing 28 controls the supply of gas to the auxiliary burner. The valve 31 as shown in Fig. 4, consists of a casing 28, having a passage 29 and having a plug arranged transversely of the passage for controlling the same. The plug is provided with a transverse passage 36, and with an opening 37 leading at right-angles from the direction of length of the passage to one side of the plug. The plug is also provided with a longitudinal passage 38, leading from the passage 36 to the pilot burner 30. A cut off valve 39 is journaled in the plug transversely of the passage 38 for controlling the said passage. The turning of the valve 39 so that the transverse passage of the valve is out of register with the passage 38, shuts off the gas from the pilot burner. The valve 31 is operated by a handle 31^a and when in the position shown in Fig. 4, the pilot burner 30 is in communication with the source of gas supply. When the valve is rotated, a quarter turn, in the proper direction to bring the passage 36 in register with the passage 29 the burner 5 is connected with the source of supply, without cutting off the pilot burner. The gas passes through the passage 29 of the casing and the passage 36 of the plug to the burner 5, and from the passage 36 through the passage 38 to the pilot burner. A valve 32 is interposed in the pipe 22 adjacent to the end of the shaft 11, and the said valve is connected to the shaft, and is operated by the

said shaft. The arrangement is such that when the box is in the full line position of Fig. 1, the valve is turned to close the pipe, and to shut off the fuel from the burner 5. When however the box is in the dotted line position, the valve is opened, and the burner 5 is supplied with gas.

The operation of the above described mechanism is as follows. The valve 31 is operated to open the auxiliary burner, and the said burner is lighted. The gas cannot reach the burner 5 however on account of the valve 32. The pipe 6 is provided with a valve 33 to be presently described more fully, and the said valve is now opened to admit water to the coil. The water flows into the coil, and rises therethrough until it reaches the box 13. As the box is filled, the weight is overbalanced, and the valve 32 is opened, by the turning of the shaft. The gas now passes to the burner 5 and is lighted by the auxiliary burner.

The valve 33 controls the supply of water from the city main or other source, and the casing of the valve is provided with a drain pipe 34, leading to a suitable point of discharge. The valve 33 is a three way valve, and when the pipe 6 is closed, the coil is placed in communication with the drain pipe. The coil is now free to drain, so that there is no possibility of damage from freezing in cold weather. Neither can the coils become overheated, for the principal burner cannot be lighted until the coil is filled. No attention is required, since the action is entirely automatic.

The valve 33 shown in Figs. 5 and 6 is arranged in a casing 40, and the said valve is provided with a transverse passage 41, and with an angular passage 42 of less capacity than the passage 41. When the valve is in the position shown in Fig. 5, the coil is connected with the source of water supply. When the valve is turned in the position shown in Fig. 6, the coil is connected with the point of discharge to drain the coil. The said valve is held in place in the casing by a nut 43, threaded on to the lower end thereof and is operated by a handle 44, having an angular lug 45, engaged with a recess 46 in the top of the valve and the handle is held in place by a set screw 47. The nipple 48 of the casing is connected by a pipe 49, with the place of discharge and the pipe 6 is connected with one of the nipples 50, and the coil 4 with the other nipple 51.

I claim—

1. The combination with the heater comprising a coil and a burner, of an auxiliary burner adjacent to the burner for lighting the same, a pipe supplying the burner and the auxiliary burner, a hand valve controlling the supply to the auxiliary burner, a valve controlling the supply to the burner and arranged between the burners, a supply

pipe leading to the lower end of the coil, a valve casing interposed in the pipe and having a drain pipe leading therefrom, a valve in the casing for simultaneously disconnecting the coil from the supply pipe and connecting it with the drain pipe, a shaft near the upper end of the coil, a box having an air vent supported on the shaft, the box extending radially therefrom, the coil connecting with the box, a counterbalance normally holding the box above the shaft, and a connection between the shaft and the valve controlling the supply to the burner for opening the valve when the box is overbalanced by water from the coil.

2. A device of the character specified, comprising in combination with the heater consisting of a water coil and a burner below the coil, of a valve controlling the fuel supply to the burner, an auxiliary burner for lighting the burner interposed in the fuel supply between the source and the valve of the burner, a shaft journaled adjacent to the heater, a box with which the upper end of the coil communicates, said box extending radially from the shaft and having an air vent, a counterbalance for the box, a connection between the shaft and the valve controlling the fuel supply for opening said valve when the shaft is oscillated by the water from the coil filling the box, said box having a discharge opening, a drain pipe leading from the coil, and a valve for simultaneously closing the supply of water to the coil and for connecting said coil with the drain pipe.

3. A device of the character specified, comprising in combination with the heater consisting of a water coil and a burner below the coil, of a valve controlling the fuel supply to the burner, an auxiliary burner for lighting the burner interposed in the fuel supply between the source and the valve of the burner, a shaft journaled adjacent to the heater, a box with which the coil communicates extending radially from the shaft, the box having an air vent, a counterbalance for the box, and a connection between the shaft and the valve controlling the fuel supply for opening said valve when the shaft is oscillated by the water from the coil filling the box, said box having a discharge opening.

4. A device of the character specified, comprising in combination with the heater consisting of a water coil and a burner below the coil, of a valve controlling the fuel supply to the burner, an auxiliary burner for lighting the burner interposed in the fuel supply between the source and the valve of the burner, a shaft journaled adjacent to the heater, a box with which the coil communicates, extending radially from the shaft, the box having an air vent, a counterbalance for the box, and a connection between the shaft and the valve controlling

the fuel supply for opening said valve when the shaft is oscillated by the water from the coil filling the box.

5 In combination with the water coil, and the burner for heating the same, of a shaft journaled near the coil, a box extending radially from the shaft and communicating with the upper end of the coil, said box having a discharge pipe leading therefrom, a counterbalance for normally holding the box above the shaft, a drain for the coil, a valve controlling the supply of water to the coil, means whereby when the valve is closed the coil will be connected with the drain, a valve controlling the fuel supply of the burner, a connection between the shaft and the valve for operating the same when the shaft is oscillated by the filling of the box with water from the coil, an auxiliary burner between the source of supply and the burner for lighting said burner, and a hand operated valve for controlling the supply of fuel to the auxiliary burner.

6 In combination with the water coil, and the burner for heating the same, of a shaft journaled near the coil, a box extending radially from the shaft and communicating with the upper end of the coil, said box having a discharge pipe leading therefrom, a counterbalance for normally holding the box above the shaft, a drain for the coil, a valve controlling the supply of water to the coil, means whereby when the valve is closed the coil will be connected with the drain, a valve controlling the fuel supply of the burner, a connection between the shaft and the valve for operating the same when the shaft is oscillated by the filling of the box with water from the coil, and an auxiliary burner between the source of supply and the burner for lighting said burner.

7 In combination with the water coil, and the burner for heating the same, of a shaft journaled near the coil, a box extending radially from the shaft and communicating with the upper end of the coil, said box having a discharge pipe leading therefrom, a counterbalance for normally holding the box above the shaft, a drain for the coil, a valve controlling the supply of water to the coil, means whereby when the valve is closed the coil will be connected with the drain, a valve controlling the fuel supply of the burner, and a connection between the shaft and the valve for operating the same when the shaft is oscillated by the filling of box with water from the coil.

8 In combination with the water coil, and the burner for heating the same, of a shaft journaled near the coil, a box extending radially from the shaft and communicating with the upper end of the coil, said box having a discharge pipe leading therefrom, a counterbalance for normally holding the box above the shaft, a drain for the coil, a

valve controlling the supply of water to the coil, and means whereby when the valve is closed the coil will be connected with the drain.

9 In combination with the water coil and the burner for heating the coil, a counterbalanced box mounted for rising and falling movement and connected with the upper end of the coil, a valve controlling the fuel supply of the burner, a connection between the box and the valve for operating the valve to open the fuel supply when the box is depressed by the water from the coil, an auxiliary burner for lighting the burner between the source of supply and the burner, a hand operated valve controlling the fuel supply of the auxiliary burner, a drain pipe for the coil, and a valve controlling the water supply of the burner, and means whereby the closing of the supply by the valve will connect the coil with the drain pipe.

10 In combination with the water coil and the burner for heating the coil, a counterbalanced box mounted for rising and falling movement and connected with the upper end of the coil, a valve controlling the fuel supply of the burner, a connection between the box and the valve for operating the valve to open the fuel supply when the box is depressed by the water from the coil, an auxiliary burner for lighting the burner between the source of supply and the burner, and a hand operated valve controlling the fuel supply of the auxiliary burner.

11 In combination with the water coil and the burner for heating the coil, a counterbalanced box mounted for rising and falling movement and connected with the upper end of the coil, a valve controlling the fuel supply of the burner, a connection between the box and the valve for operating the valve to open the fuel supply when the box is depressed by the water from the coil, and an auxiliary burner for lighting the burner between the source of supply and the burner.

12 In combination with the water coil and the burner for heating the coil, a counterbalanced box mounted for rising and falling movement and connected with the upper end of the coil, a valve controlling the fuel supply of the burner, and a connection between the box and the valve for operating the valve to open the fuel supply when the box is depressed by the water from the coil.

13 In combination, a water coil, a burner for heating the coil, a valve controlling the fuel supply to the burner, and means operated by an excess of water in the coil for opening the said valve, an auxiliary burner between the source of supply and the water, and a valve for controlling the fuel supply of the auxiliary burner, a drain pipe for

the coil, and means for simultaneously shutting off the water supply to the coil and connecting the coil with the drain pipe.

14. In combination with the water receptacle and the burner for heating the water in the receptacle, a counterbalanced box mounted for rising and falling movement and connected with the receptacle at its upper end, a valve controlling the fuel supply of the burner, a connection between the box and the valve for operating the valve to open the same when the box is depressed by the water from the receptacle, an auxiliary burner for lighting the burner arranged between the source of supply and the burner, and a hand operated valve controlling the fuel supply of the auxiliary burner.

15. In combination with the water receptacle and the burner for heating the water in the receptacle, of a counterbalanced box mounted for rising and falling movement and connected with the upper end of

the receptacle, a valve controlling the fuel supply of the burner, a connection between the box and the valve for opening the said valve when the box is depressed by an excess of water in the receptacle, and an auxiliary burner for lighting the burner arranged between the source of supply and the burner.

16. In combination with the water receptacle and the burner for heating the water therein, a counterbalanced box mounted for rising and falling movement and connected with the upper end of the receptacle for receiving the excess water therefrom, a valve controlling the fuel supply of the burner, and a connection between the box and the valve for opening the valve when the box is depressed by an excess of water from the receptacle.

STEAD I. SHAND.

Witnesses:

MARY W. SHAND,

W. W. SHAND.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."