

C. R. DIEHL.
 AUTOMATIC GAS VALVE.
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Patented Apr. 1, 1913.

1,057,625.

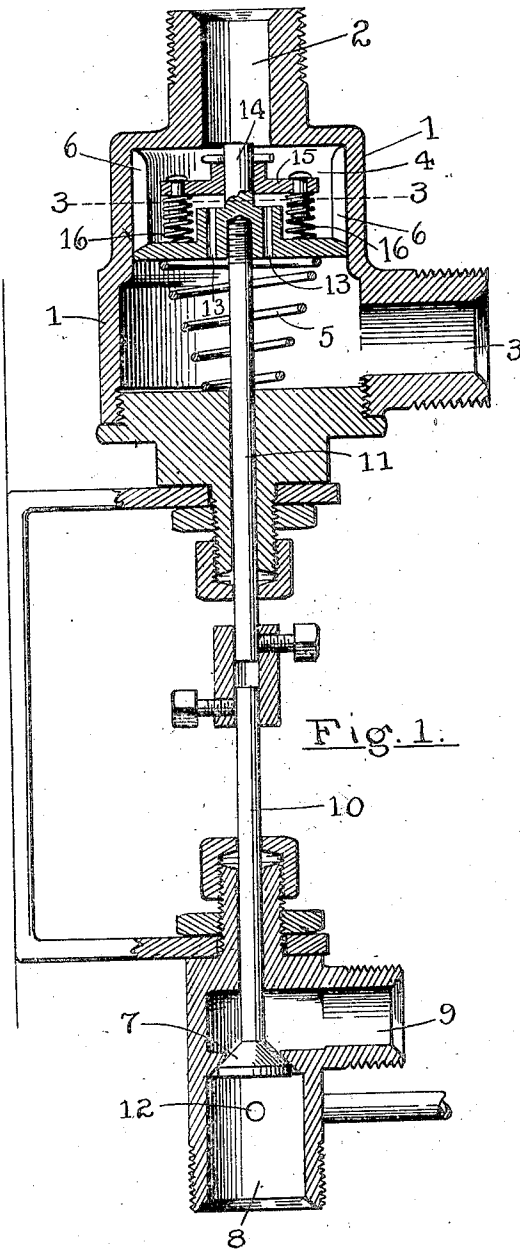


Fig. 1.

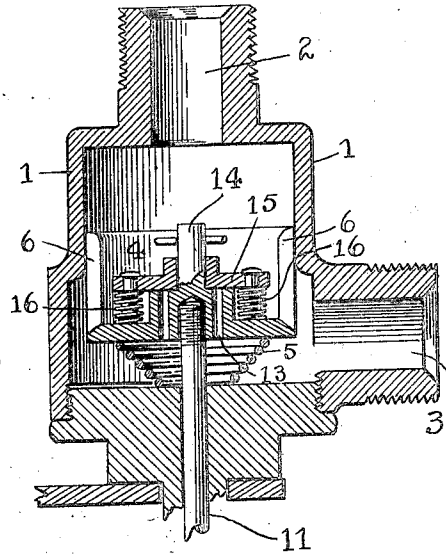


Fig. 2.

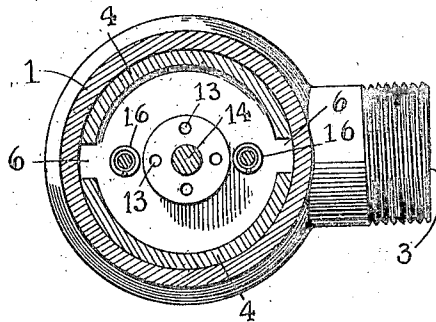


Fig. 3.

Witnesses
Harold C. Van Antwerp
Anna De Windt

Inventor
Charles R. Diehl
 By *Luther V. Moulton*
 Attorney

UNITED STATES PATENT OFFICE.

CHARLES RANSON DIEHL, OF JACKSON, MICHIGAN.

AUTOMATIC GAS-VALVE.

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To all whom it may concern:

Be it known that I, CHARLES R. DIEHL, a citizen of the United States of America, residing at Jackson, in the county of Jackson and State of Michigan, have invented certain new and useful Improvements in Automatic Gas-Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in automatic gas valves and more particularly to the type adapted to be used on automatic water heaters and the like, and its object is to provide the device with an automatic mechanism which will enable the valve to return quickly to closed position as soon as the water pressure is turned off and to provide the same with various other new and useful features hereinafter more fully described and particularly pointed out in the claims.

In illustrating my improved device, I have shown an ordinary form of gas valve which I herein describe for the purpose of more clearly bringing out the nature of my invention, reference being had to the accompanying drawing, in which:

Figure 1 is a sectional elevation through the axis of a device embodying my invention; Fig. 2 is a vertical section of the motor in the position it will assume after the water has been turned on to allow the water to pass through it; and Fig. 3 a horizontal section on the line 3-3 of Fig. 1.

Like numbers refer to like parts in all of the figures.

1 represents the body of the water motor for operating the gas valve, cylindrical in shape, having its lower portion slightly larger in diameter than its upper portion and provided with an inlet passage 2 leading to the upper portion and an outlet passage 3 from the lower portion. A piston 4 fits within the upper or smaller portion of the valve body and is normally held within this upper portion by a coiled spring 5 beneath the piston. Lateral openings or ports 6 are provided in the piston wall through which the water may pass after the piston has been lowered by the pressure of the water entering at the inlet passage 2; this water pressure forcing the piston down until sufficient length of the ports 6 is opposite the enlarged lower portion of the valve

chamber to enable the incoming volume of water to pass freely through the ports and out through the passage 3 from whence it is conducted to the water heater by any suitable pipe.

The gas for the heater is controlled by a valve 7 automatically operated by the piston. This gas valve casing has an inlet 8 and an outlet 9 and said valve normally engages its seat to prevent the passage of gas. A stem 10 attached to the valve 7 extends upward and is connected to the lower end of a piston rod 11 which is fixed in the piston of the motor thus connecting the piston and gas valves so that they will move simultaneously.

It is obvious that when the water is admitted and the piston lowers to allow the water to pass that the gas valve 7 will open at the same time allowing a passage of gas to the gas burner of the water heater. As the gas passes through the burner in the water heater it is ignited by a pilot light which is kept continuously burning, gas being supplied to the pilot light through an opening 12 in the inlet 8 of the gas valve.

The objectionable feature of this type of automatic valve is that when the water is shut off and the piston 4 starts to return to its place it will trap a certain amount of water above it which is usually allowed to seep slowly through a small vent or opening in the piston before the valve will return to its normal closed position and during the time that this valve is slowly closing the gas burner will be wasting gas, overheating and possibly damaging the water heater. I have overcome this objectionable feature by providing an automatic relief valve in the piston 4 normally open when the water is shut off and permitting free passage of water through the piston, and closed by impact of the water when the same is flowing through the motor, whereby the piston is returned and the gas valve promptly closed. This relief valve comprises a series of openings 13 through the piston head, these openings being preferably grouped about an upwardly extending pin 14 upon which is slidably mounted a disk 15 having a stop to limit its upward movement and normally held against this stop by one or more springs 16 beneath it. This disk is within the cup shaped piston and directly beneath the water inlet 2. When the water is admitted it will strike the disk 15 compressing the spring 16

and forcing the disk downward to close the openings 13 thus preventing the passage of water therethrough while the piston is in action. After the water has been turned off 5 and the pressure released the disk 15 will be raised by the springs 16 opening the passage 13 and allowing the water which remains above the piston to pass freely there-through thus permitting the gas valve to be 10 returned quickly to closed position by means of the spring 5. It will be noted that after the water is shut off there remains a slight excess of pressure above the piston due to the opposite pressure of the spring 5. The 15 spring 16 will open the valve 15 against this pressure however, but will yield to the impact of water on the valve when the same is flowing through the motor.

What I claim is:—

- 20 1. In combination with a gas controlling valve; a cylinder having an inlet at the top and an outlet near the bottom, a piston movable in the cylinder and connected to the valve to control the same, a spring yieldably 25 supporting the piston and closing the valve, said piston also having a vent opening there-

through, a vent valve above the piston and opposite the inlet opening of the cylinder, and a spring supporting the vent valve above the piston in the open position, and yielding 30 to permit the valve to be closed by impact of the current of fluid flowing through the cylinder.

2. The combination with an automatic gas valve having a motor provided with a piston, of an automatic water release, comprising a guide pin projecting from one side of the piston, a series of passages through the piston grouped about the guide pin, a disk 35 slidably mounted upon the guide pin, springs to normally space the disk away from the passages, said disk being adapted to move 40 downward by impact of fluid passing through the motor to close the passages substantially as described. 45

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES RANSON DIEHL.

Witnesses:

WALTER S. WILSON,
J. H. SMITH.