

J. ELLIS.
 WATER VALVE FOR INSTANTANEOUS WATER HEATERS.
 APPLICATION FILED FEB. 28, 1912.

1,049,829.

Patented Jan. 7, 1913.

FIG. 1

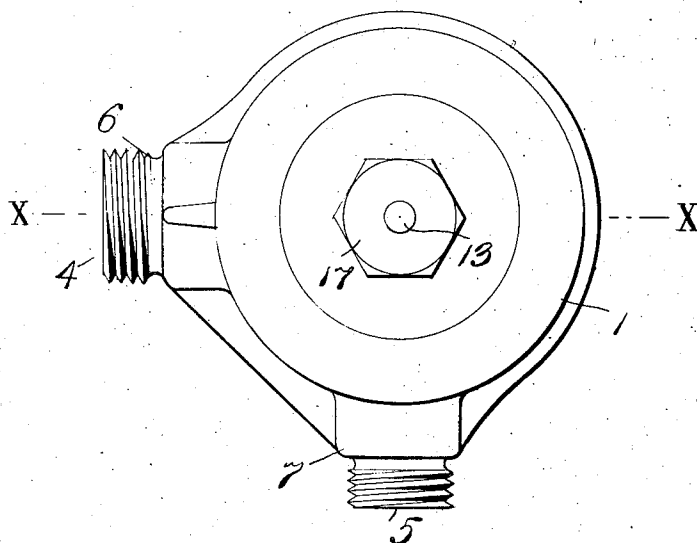
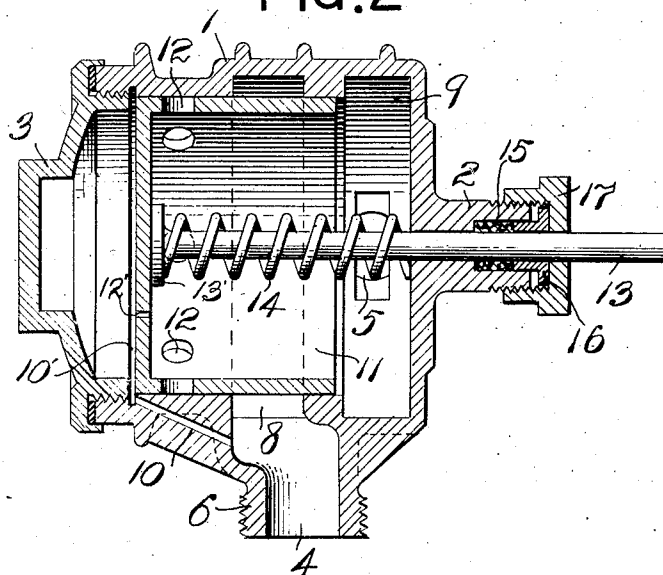


FIG. 2



WITNESSES

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WATER-VALVE FOR INSTANTANEOUS WATER-HEATERS.

1,049,829.

Specification of Letters Patent.

Patented Jan. 7, 1913.

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To all whom it may concern:

Be it known that I, JOHN ELLIS, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Water-Valves for Instantaneous Water-Heaters, of which improvement the following is a specification.

My invention relates to water-controlling valves of the class known as "automatic", as employed in connection with instantaneous water heaters, and is adapted to automatically control the water supply to the heater and operate the gas supply valve.

The invention has for its objects, to provide a slow acting valve of the above class, that will be simple in construction, be of as few parts as possible, and respond under all necessary conditions of service.

With the above objects in view, the invention consists in certain novel features of construction, and in certain parts, improvements, and combinations as will be hereinafter fully described and pointed out in the appended claims.

One embodiment of the invention is illustrated in the accompanying drawings in several views, each detail part of the structure being given and referred to by its individual reference numeral, said views representing the following:

Figure 1 is an end elevation of the device. Fig. 2 is a transverse sectional view of the same, taken on the line X—X of Fig. 1.

In detail, the structure comprises a chamber casing 1 having an integral head at its forward end provided with a stuffing box 2, and a removable head 3 at the rear end. A water inlet 4 and a water outlet 5 extend through the respective exteriorly-threaded and projected bosses 6 and 7 of the casing. The interior or chamber portion of the casing, wherein the valve operates, is provided with two spaced annular grooves 8 and 9, respectively. The groove 8 extending about the valve seat, communicates with the water inlet, and the groove 9, located at the forward end of the chamber, communicates with the water outlet, said chamber being further provided with a small pressure port 10 extending from the water inlet to and terminating in the annular groove 10' at the rear thereof. Movable fitted within the chamber is a cup-shaped piston valve 11 of the same diameter throughout, the closed end or head thereof being disposed toward

the rear end of the chamber, and is provided with a plurality of spaced ports 12 extending through its annular wall near the head, the head of the piston being provided with a small leakage port 12'. A stem 13 extends out from the interior of the chamber through the stuffing box, the inner end 13' of said stem being at all times in engagement with the inner surface of the piston head, being so held by the spiral spring 14, said stuffing box being provided with suitable stuffing 15, a gland 16 and adjusting cap 17.

Normally, the piston valve occupies the cut-off position indicated in Fig. 2, and when the device is connected in the water line of the heater, in the usual manner, with the outer end of the stem 13 positioned for operating the gas valve of the heater, the operation thereof would be as follows: Opening of the faucet connected to the water line of the heater relieves the pressure of accumulated water on the right or forward end of the piston, thus permitting a gradual increase of water to take place in the chamber portion at the rear or left, through the pressure port 10, the pressure of which acts upon the head of the piston and causes it to slowly move a sufficient distance to the right to permit the ports 12 thereof to establish communication with the inlet groove 8, thus allowing free and unrestricted passage of the incoming water to flow into and through the heater to and issue at the service faucet. Upon closure of the faucet, the spring 14 acts upon the piston, forcing it to the left, the water in the left or rear end of the chamber being slowly displaced through the small leakage port 12' of said piston to the right of the chamber, the preponderance of spring and water pressures acting thus upon the right side of the piston slowly returns the same to its normal position where a balance of pressure is established.

As before stated, the stem of the piston valve is made use of to simultaneously operate the gas valve of the heater to which the device is applied, the movement of the piston, on opening the faucet, acting upon and opening the gas supply valve on its outward movement, and on its inward or return movement permitting closure of the gas valve, as is well understood.

By forming the piston valve of the same diameter throughout, also the bore of the chamber where it operates, such parts may be more readily finished than otherwise, the

absence of cast ports on such parts allowing perfect finishing. Again, the piston valve, by reason of its being of the same diameter throughout, the wear is equally distributed and any tendency to unalign and stick is avoided.

Having thus shown and described an embodiment of my invention, what I claim is—

1. In a water valve mechanism for instantaneous water heaters, the combination of a valve chamber casing having a water inlet, a water outlet, an annular groove about the valve seat communicating with the water inlet, a like groove at the forward end of the chamber communicating with the water outlet, and a pressure port extending between the rear of the chamber and water inlet, a cup-shaped piston valve arranged within said chamber with its head toward the rear end thereof and provided with a plurality of ports formed through its annular wall, and further provided with a leakage port communicating with the water inlet, a stem extending through the forward end of the chamber for moving with the piston valve, and a spring on said piston stem.

2. In a water valve mechanism for instan-

taneous water heaters, the combination of a valve chamber casing having a water inlet, a water outlet, an annular groove about the valve seat communicating with the water inlet, a like groove at the forward end of the chamber communicating with the water outlet, a groove in the rear end of the chamber communicating with the water inlet by a pressure port, a cup-shaped piston valve arranged within said chamber with its head toward the rear thereof and provided with a plurality of ports formed through its annular wall, and further provided with a leakage port communicating with the water inlet, a stem extending through the forward end of the chamber the inner end thereof being provided with a head engaging the piston, and a spiral spring disposed about said stem, within the chamber, and engaging with the head thereof and chamber head.

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN ELLIS.

In the presence of—

D. B. OAKS,

R. S. HARRISON.

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