

B. E. MEACHAM.
THERMOSTATIC GAS CUT-OFF FOR WATER HEATERS.
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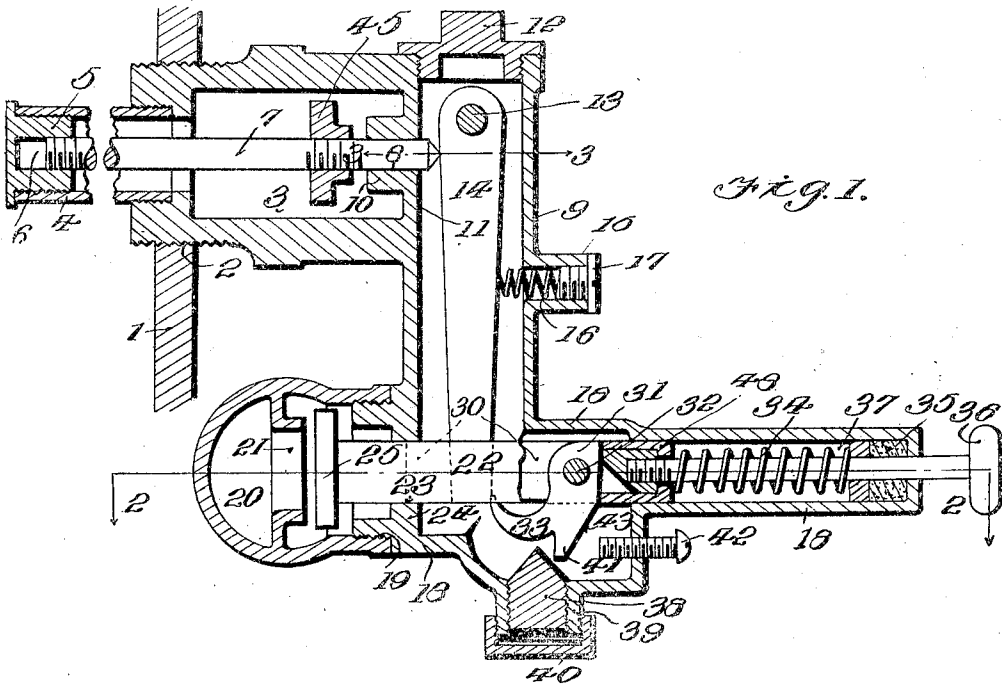


Fig. 1.

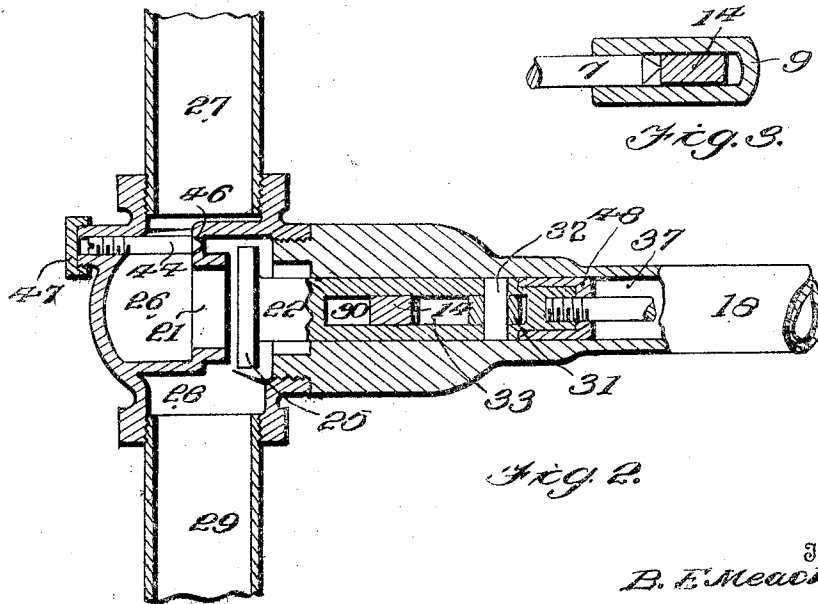


Fig. 2.

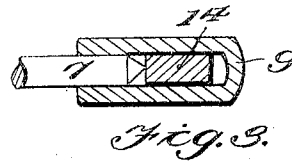


Fig. 3.

Witnesses
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THERMOSTATIC GAS CUT-OFF FOR WATER-HEATERS.

1,108,772.

Specification of Letters Patent.

Patented Aug. 25, 1914.

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To all whom it may concern:

Be it known that I, BENJAMIN E. MEACHAM, a citizen of the United States, residing at Lorain, in the county of Lorain and State of Ohio, have invented certain new and useful Improvements in Thermostatic Gas Cut-Offs for Water-Heaters, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to improvements in thermostatic gas cut-offs for water heaters.

The object of my invention is to provide a cut-off of this character which will automatically, by thermostatic means, cut-off the gas supply to the heater when the water in the heater has reached a certain temperature, whereby the water in the boiler is allowed to cool and after it has been sufficiently cooled the gas is again turned on to bring the water up to the desired temperature.

Another object of my invention is to provide means whereby the device may be readily changed to cut off the gas at different temperatures of the water and have certain details of structure hereinafter fully set forth.

In the accompanying drawings Figure 1 is a vertical sectional view of my improved cut-off. Fig. 2 is a horizontal sectional view taken on the line 2-2, Fig. 1. Fig. 3 is a horizontal transverse section taken on the line 3-3, Fig. 1.

Referring now to the drawing, 1 represents the boiler or water receptacle of a heater which is provided with a burner supplied with gas, and my improved cut-off is adapted to cut off the gas from said burner.

The said receptacle is provided with a screw-threaded opening 2 into which is screwed the elongated housing 3, which is preferably of a cylindrical form, and having its inner end internally screw-threaded and into which is screwed the copper expanding tube 4, which extends within the water of the receptacle and is expanded by the heat thereon. Screwed within the inner end of the tube is a plug 5, which is provided with a screw-threaded recess 6 into which is screwed the negative expanding rod 7, which extends outwardly through the housing 3.

The outer end of the housing 3 is closed

and provided with a small opening 8, which communicates with the vertically disposed housing 9. The opening within the housing has a bushing 10 surrounding the same and which forms an elongated bearing for the outer end of the rod 7. The rod 7, as shown, extends through the opening and beyond the inner wall 11 of the housing 9.

The housing 9, as shown, is of a rectangular form, as shown in Fig. 3 of the drawings, and is provided with an upper open end closed by the screw-cap 12. Pivoted at 13, within the upper end of the housing, is a lever 14, which is adapted to swing in the housing in the same direction as the movement of the rod 7. The rod 7, as shown, engages said lever or, in other words, the lever is normally held in engagement with the said rod. In order to hold the lever in engagement with the rod, I provide a cylindrical housing 15 in which is placed a coiled spring 16. The inner end of the spring engages the lever 4, and the outer end a cap or plug 17, screwed within the housing 15, and whereby the tension of the spring on the lever may be varied by screwing the plug 17 in or out as desired. The lower end of the housing 9 has formed thereto and in communication therewith, a horizontal housing 18, into which extends the lower end of the lever 14. This housing 18 is of a cylindrical form and having at one end the externally threaded portion 19, upon which is screwed the valve casing 20, having the raised valve seat 21.

Within the housing 18 is a cylindrical piston 22, which extends through an opening 23 in the web 24 of the housing, and extends within the valve-casing 20. The outer end of the piston is provided with a valve 25, which is adapted to seat itself upon a seat 21 and close the communication between the space 26, connected to the gas supply-pipe 27, for the burner and the space 28 connected with the pipe 29 leading from the gas supply. The said piston 22 is provided with a vertical elongated slot 30 into which extends the lever 14. Within the outer end of the slot 30 is a trip lever 31, pivoted at 32, and which has an upwardly curved finger 33, which engages the lower end of the lever 14, and moves the same with the piston as it is moved toward the left. The piston 22 is provided with a rod

34 which extends out through the stuffing box 35, and is provided with a hand-lever or wheel 36, by means of which the piston is moved longitudinally. The outer end of the piston is reduced and surrounding the same is a sleeve 48, against which the coiled spring 37 bears and normally holds the valve close. The sleeve is longitudinally movable upon the piston and has its inner end engaging the trip lever 31, and holding it against the lever 14, as shown in Fig. 1. On the forward movement of the piston the engagement of the lever 31 with the plug 38 moves the sleeve upon the piston against the spring and allows the lever to swing downwardly.

As will be readily seen the rod 7 normally extends out sufficiently to hold the lever 14 in such a position that the piston 22 is held against the tension of the spring 37 and the valve 25 held unseated so that there is a full flow of gas from the pipe 29 to the pipe 27. The expansion of the metal of the tube 4, will move the rod 7, so that the lever 14 may move to the left and thus allowing the piston 22 to move to the left so that the gas valve is closed. This cuts off the gas from the burner and thus the water in the tank or receptacle 1 begins to cool. This contracts the tube 4 and forces the rod 7 outwardly moving the lever 14 to the right, which carries with it the piston 22, carrying the valve and allows the gas to again enter the burners. This, as is readily understood, compresses the spring 37 and the lever and trip lever are held in the position shown in Fig. 1.

In order to release the trip lever 31 so that the engagement between it and the lever 14, will be released, I provide the housing 18 with a plug 38, screwed into the flange 39 and the same closed by a cover 40. The upper end of said plug is conically shaped and is in the path of travel of the downwardly extending arm 41 integral with the trip lever 31. From this it will be seen that as the rod 7 moves inwardly and the lever 14 is forced over by the springs 16 and 37, the arm 41 engages the conical end of the plug 38, and the said arm is forced downwardly so that the portion 33 is below the lever 14 and thus uncoupling this lever 14 from the piston 22, whereby the lever moves independently of the piston and upon the tube 4 contracting, the outward movement of the rod will move the lever 14 outwardly, but the same being disconnected from the piston 22, the valve 25 will remain upon the seat and the gas remain cut off and the valve will have to be opened by hand. In order to again couple the lever 14 and the piston 22 together, I provide a screw 42 which strikes the beveled face 43 of the trip lever and forces it up so that the end 33 is brought up in rear of the lever

and the same held by friction. The plug 38 is removed or screwed down so as not to engage the arm 41 of the trip lever when it is desired that the valve be opened and closed by the lever 14 the movement of which has been heretofore described. On the rod 7, I place a regulating nut 45, whereby the movement of the rod 7 is regulated for the purpose heretofore described. The valve case 20 is provided with a screw valve 44, which controls an opening 46, which allows for the passage of a small amount of gas to be fed to the pilot burner. The outer end of said screw is covered by a cap 47 to prevent the escape of gas.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. An automatic gas cut-off, comprising a valve normally spring closed, a pivoted lever engaging the valve, a latch for locking the lever to the valve, and thermostatic means for controlling the lever and means for releasing the latch by the closing of the valve.

2. An automatic gas cut-off, comprising a valve normally spring closed, a latch for locking the valve open, thermostatic means engaging the latch for controlling the said valve and means for releasing the latch by the closing of the valve.

3. An automatic gas cut-off comprising a valve, normally spring closed, a latch for locking the valve open, thermostatic means engaged by the latch for controlling the said valve, and means for engaging the latch during the closing of the valve for uncoupling the valve from the thermostatic means.

4. An automatic gas-cut-out, comprising a valve normally spring closed, a valve stem carried by the valve and having an opening therethrough, a pivoted lever adapted to pass into the opening in the stem, thermostatic means for controlling said lever, a latch carried by the stem for locking the lever in the stem, and means for releasing the latch by the closing of the valve, in which unlatched position the valve may be opened independent of the lever.

5. An automatic gas-cut-out, comprising a valve normally spring closed, a pivoted lever engaging the valve, a latch for locking the lever to the valve, thermostatic means for controlling the lever, and means for releasing the latch by the closing of the valve, in which unlatched position the valve may be opened independent of the lever.

6. An automatic gas-cut-out, comprising a valve normally spring closed, a pivoted lever engaging the valve, a latch for locking the lever to the valve, thermostatic means for controlling the lever, means for releasing the latch by the closing of the valve, in which unlatched position the valve may be opened independent of the lever and

means for closing the latch by the opening valve.

7. An automatic gas-cut-off for heaters, comprising a housing connected to the heater, a valve in the housing, a valve stem carried by the valve, a spring engaging the stem and normally holding the same closed, a lever pivoted in the housing and extending at right angles to the valve stem and having its lower end entering said stem, a rod extending at right angles to the lever and engaging the same, thermostatic means moving said rod, and means whereby the lever may be disconnected from the valve stem so that the lever may move independent of the valve stem.

8. An automatic gas-cut-off for heaters, comprising a housing connected to the heater, a valve in said housing, a valve stem carried by the valve, a spring engaging the stem and normally holding the valve closed, a lever pivoted in the housing and extending at right angles to the valve stem and having its lower end entering said stem, a rod extending at right angles to the lever and engaging the same and holding the valve open against the tension of the spring, thermostatic means for moving the rod inwardly to allow the lever to move and the valve to seat, and automatic means caused by the closing movement of the valve for disconnecting the valve stem from the lever, whereby the valve will remain closed.

9. An automatic gas-cut-off for heaters, comprising a housing connected to the heater, a valve in said housing, a valve stem carried by the valve, a spring engaging the stem and normally holding the valve closed, a hand operating means for said valve, a lever pivoted at its upper end within the housing and extending at right angles to the valve stem, and having its lower end entering an elongated slot in the valve stem, a spring holding the lever inwardly, a rod engaging the lever intermediate its ends, thermostatic means for moving the rod inwardly to allow the lever to move and the valve to seat, a trip lever within the slot in the stem and engaging the lever and locking the stem to the lever, a downwardly extending arm carried by the trip lever, a movable projection in the housing engaging the arm of the trip lever and moving the same downwardly to disconnect the lever and valve stem, and adjustable means in the casing and adapted to engage the trip lever and move it upwardly to connect the stem and lever by the movement of the stem to the right by the hand-operating mechanism.

10. An automatic gas-cut-off for heaters, comprising a housing connected to the heater, a valve in said housing, a valve stem carried by the valve, a trip lever pivoted within the piston, a lever extending through the piston and locked thereto by the trip

lever, a sleeve sliding upon the piston and engaging the trip lever, a spring surrounding the valve stem and normally holding the valve close and holding the sleeve against the trip lever to hold it in engagement with the lever, a movable projection in the housing and engaging an arm carried by the trip lever, and thermostatic means connected to the lever whereby the valve is opened or closed.

11. An automatic gas cut-off, comprising a valve, a spring for normally holding the valve closed, a valve stem, a lever, a trip lever carried by the valve stem connecting the lever to the valve stem, and thermostatic means for operating said lever.

12. An automatic gas cut-off, comprising a valve, a spring for normally holding the valve closed, a lever, a trip-lever carried by the valve stem connecting the lever to the valve, and thermostatic means for operating said lever.

13. An automatic gas cut-off, comprising a valve, a spring for closing the valve, a valve stem, a lever, a trip lever carried by the valve stem connecting the lever to the valve stem, and a thermostatic means for moving the lever in one direction for opening the valve against the tension of the spring.

14. An automatic gas cut-out, comprising a valve, a valve stem having a slot there-through, a lever having one end entering said slot, means within the slot for coupling the lever to the valve stem, and thermostatic means for operating said lever.

15. An automatic gas cut out, comprising a valve, a valve stem having a slot there-through, a lever having one end extending into said slot, means for coupling the said lever to the stem within the slot, means operated by the movement of the stem uncoupling said coupling means, and thermostatic means for operating said rod.

16. An automatic gas cut-out, comprising a valve, a valve stem having a slot there-through, a lever having one end extending into said slot, a trip-lever within the slot for holding the lever against movement in the slot in one direction, means for releasing said trip lever by the movement of the stem in one direction, means for operating the lever in one direction, and means for moving the trip lever to its normal coupled position by the movement of the stem in the opposite direction, and thermostatic means for moving the lever.

17. An automatic gas cut-out, comprising a valve, a valve stem, having a slot there-through a spring action on the stem for closing the valve, hand means carried by the outer end of the valve stem for opening the valve against the action of the spring, a lever having one end extending into the slot in the valve stem, a trip lever within the

slot in the stem for holding the lever against movement in the slot in one direction, means for releasing said trip lever by the inward movement of the valve stem, means for moving the trip lever to its upward position by the movement of the valve stem against the tension of the spring by the hand operating means, and thermostatic means for

moving the lever in a direction to open the valve.

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

BENJAMIN E. MEACHAM.

Witnesses:

A. W. CRISSINGER,
LUELLA ROTH.