Sept. 30, 1924. 1,509,928

W. R. BREEDS

THERMOSTATIC CONTROLLING DEVICE FOR HOT WATER BOILER HEATERS

Filed Feb. 28. 1921

Fig.2.

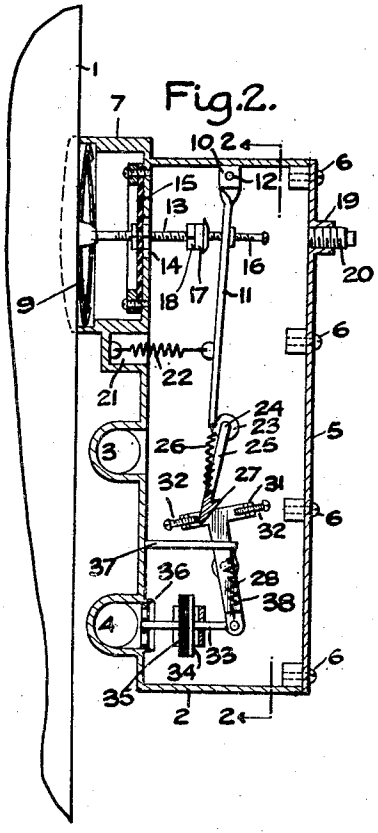


Fig.4.

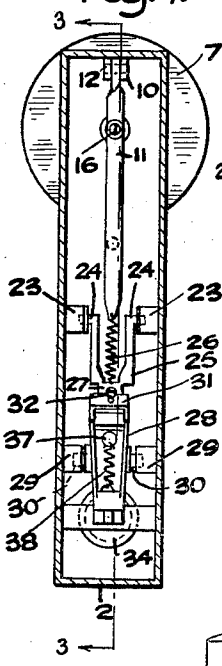


Fig.3.

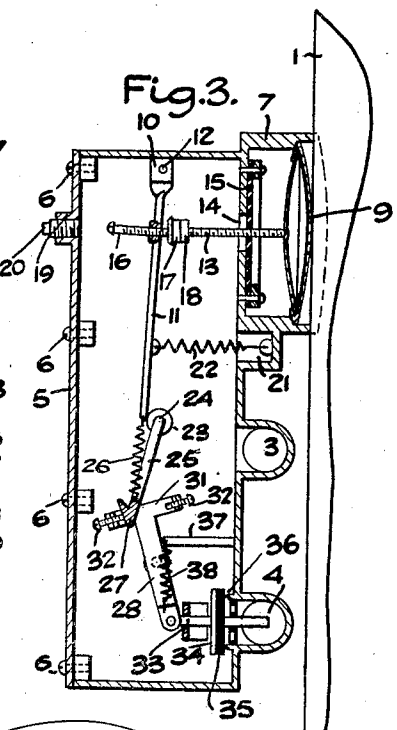


Fig.5.

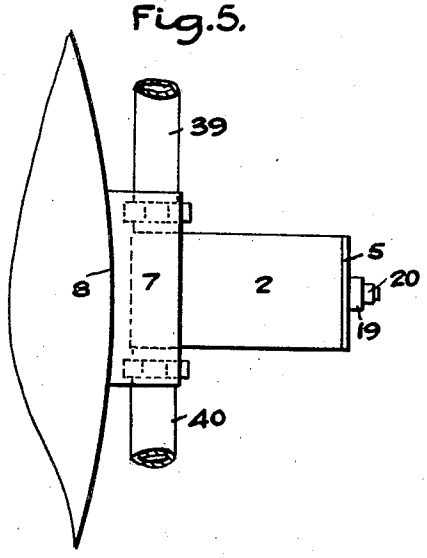
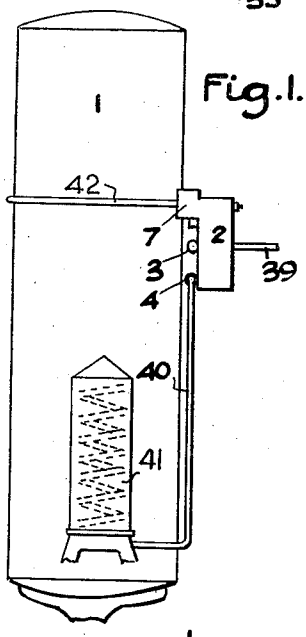


Fig.1.



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UNITED STATES PATENT OFFICE.

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THERMOSTATIC CONTROLLING DEVICE FOR HOT-WATER-BOILER HEATERS.

Application filed February 28, 1921. Serial No. 448,535.

To all whom it may concern:

Be it known that I, WILLIAM ROBERT BREEDS, a subject of the King of Great Britain, and a resident of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Thermostatic Controlling Devices for Hot-Water-Boiler Heaters, of which the following is the specification.

My invention relates to improvements in thermostatic controlling devices for hot water boiler heaters and the object of the invention is to devise a simple and effective mechanical controlling device which can be readily applied to hot water boilers and which will control the operation of the hot water heater connected thereto. A further object is to construct a device that can be applied to any part of the boiler depending on how much hot water is required.

My invention consists of a controlling device constructed and arranged all as hereinafter more particularly described and illustrated in the accompanying drawing in which:

Fig. 1 represents a side elevation of a hot water boiler showing my device applied thereto.

Fig. 2 is a vertical section through the device showing the mechanism in such position that the gas passing through the casing thereof will have access to the hot water heater.

Figure 3 is a vertical section through the section line 3—3, Figure 4, and showing the different parts of the mechanism in such position that the gas entering the casing of the controlling device is prevented from passing to the hot water heater.

Fig. 4 is a section through the line 4—4 Figure 2, and

Fig. 5 is a top plan view of my device.

Like characters of reference indicate corresponding parts in the different views.

1 is the hot water boiler. 2 is the casing of my controlling device provided with the main gas inlet 3 and the gas outlet 4 suitably connected to the burner of the hot water heater 41. 5 is a cover plate for the casing 2 suitably secured thereto by the screws 6.

7 is a hollow boss preferably of cylindrical shape formed at the top of the casing 2 on the side nearest the boiler 1, the outer end of the boss being open and suitably curved at 8 to conform with the convexity of the boiler so that upon the boss being applied thereto the outer edge thereof will fit snugly against the side of the boiler.

9 is a thermostatic capsule inserted into the boss 7 and free therein, said thermostatic capsule being adapted to be secured against the side of the boiler 1 by means of the straps 42.

The thermostatic capsule may be constructed of any suitable design and the particular construction forms no part of the present invention.

10 is a bearing lug suitably formed on the interior of the top of the casing 2. 11 is a lever pivoted at one end to the bearing lug 10 by the pin 12. 13 is a spindle extending through an orifice 14 in the wall of the casing and into the boss 7, said spindle being suitably mounted on the leather diaphragm 15 which covers the orifice 14, the outer end of the spindle 13 being adapted to engage the thermostatic capsule.

16 is a screw threaded through the lever 11 and adapted to engage a nut 17 on the free end of the spindle 13, said nut being held in place by a lock nut 18. 19 is an interiorly threaded hollow boss on the side of the casing 2 remote from the boiler, said boss being closed by a threaded plug 20.

21 is a closed hollow boss communicating with the interior of the casing and formed on the same immediately below the boss 7. 22 is a spring connected at one end to the end of the hollow boss and at the other end to the lever 11 intermediately of the length of the same. 23 are inwardly extending bearing lugs formed on the interior of the casing and adapted to receive the outwardly extending trunnions 24 of the U-shaped tripping member 25.

26 is a spring connected at one end to the free end of the lever 11 and at the other end to the tripping member 25 in the vicinity of its free end, such free end 27 being preferably constructed of wedge shape. 28 is a valve operating beam freely mounted on the inwardly extending bearing lugs 29 formed on the interior of the casing 2 by the trunnions 30 which extend freely into the same.

31 is a rectangular loop shaped frame formed on one end of the beam 28 and adapted to receive the wedge shaped end 27 of the tripping member 25. 32 are adjusting screws extending inwardly through the ends of the loop shaped member and adapted to engage the end 27 of the tripping member.

The opposite end of the beam 28 has the valve stem 33 pivotally connected thereto at one end, the free end of such valve stem carrying the valve 34, provided with a sealing pad 35 constructed of rubber, leather or other suitable material and adapted to seat on the seat 36 communicating with the gas outlet 4. 37 is a post extending up through the side members of the beam 28 and 38 is a spring connected at one end to the post 37 and at the other end to the end of the beam 28 remote from the frame 31.

The operation of the device is as follows: Assuming that the respective parts are in the closed position shown in Figure 3 the gas from the gas main will pass from the pipe 39 through the inlet 3 into the interior of the casing but will be prevented from passing out of the gas outlet 4 into the pipe 40 communicating with the gas jets in the hot water heater 41 by the valve 34 being closed. When the temperature of the water in the boiler 1 falls to a predetermined temperature at the point where the boss 7 is applied thereto, the capsule 9 will contract and consequently as the spring 22 holds the spindle 13 in engagement with such capsule the lever 11 will be swung over from the position shown in Figure 3 to the position shown in Figure 2. When this occurs the free end of the lever will pass the axis of the trunnions of the tripping member 25 and being connected thereto by a spring 26 will trip the member, causing the wedge shaped end 27 to engage the left hand screw 32 (Fig. 2) and thus swing over the beam 28 into the position shown in Figure 2 consequently lifting the pad 35 of the valve 34 off the seat 36 and thus permitting the gas to flow through the main pipe 39, gas inlet 3, from the casing, out of the gas outlet 4, through the pipe 40 into the jets of the gas heater, it being understood that a pilot light is always provided in the gas heater to light the gas when the jets are turned on.

Now when the water in the boiler reaches the desired temperature at the level where the boss 7 is applied thereto the thermostatic capsule 9 will expand, thus moving the spindle 13 against the adjusting screw 16 and causing the swinging of the lever 11 into the position shown in Figure 3. When this occurs, upon the free end of the lever passing the axis of the trunnions 24 the tripping member 25 will be tripped and the wedge shaped end 27 of such member will engage the other screw 32, thus swinging the beam 28 about its trunnions and causing the pad 35 of the valve 34 to seat on the valve seat 36, consequently cutting off the supply of gas to the heater.

By removing the plug 20 the adjusting screw 16 may be adjusted so as to cause the spindle 13 to swing over the lever 11 either sooner or later as desired, thus providing an adjustment therefor by means of which the thermostatic capsule 9 will actuate the tripping member at a lower or higher temperature as desired irrespective of the position at which such capsule is placed on the boiler.

My device may be applied to the boiler at any desired level in order that either the whole water in the boiler may be heated or any required part thereof. For instance, assuming that the boiler is of thirty gallon capacity if it is found that only ten gallons is usually used by the household at one time, the device may be applied to such boiler at a distance of one-third from the top of the boiler and consequently only the top one-third of the water in the boiler will be heated prior to the gas being cut off from the water heater. Further, where it is desirable to vary the temperature required the adjusting screw 16 may be adjusted so that the device will trip earlier or later as the case may be.

It will also be seen by providing the inlet and outlet gas orifices as shown that the pipes 39 and 40 may be applied thereto from either side of the casing or from opposite sides as the case may be. It frequently occurs in piping, that this is desirable if there is not room to connect the pipes as shown in Figure 5, it being necessary to connect both pipes to the orifices from either one side or the other.

From the above description it will be apparent that I have devised a simple and effective controlling device for heaters for hot water boilers which will be automatic in operation and with which the desired quantity of water in the boiler may be heated to the desired temperature, thus effecting an economy of gas that is impossible where the whole of the water in the boiler is heated.

No means is shown for holding the boss 7 in engagement with the boiler but it is to be understood that this is preferably done by supporting the casing on the gas pipes. If desired however, a strap can be used surrounding the boiler and secured to the boss 7.

My device also possesses the additional advantage that it will have a snap action and consequently prevent any backfiring in the air chamber of the gas burner.

What I claim as my invention is:

1. In thermostatic controlling devices for hot water boiler heaters, the combination with a gas inlet valve for the heater and a valve casing, of a thermostatically actuated lever pivoted in the casing, a swingable trigger journalled intermediately of the length of the casing, spring connecting means between the trigger and the free end of the lever, an intermediately journalled beam in the casing having one end pivotally

connected to the valve and the other end constituting a ring into which the trigger is inserted, and spring means for normally holding the valve seated.

2. In thermostatic controlling devices for hot water boiler heaters, the combination with a gas inlet valve for the heater and a valve casing, of a thermostatically actuated lever pivoted in the casing, a swingable trigger journalled intermediately of the length of the casing, spring connecting means between the trigger and the free end of the lever, an intermediately journalled beam in the casing having one end pivotally connected to the valve and the other end constituting a ring into which the trigger is inserted, opposed adjustable trigger engaging means on the ring, and spring means for normally holding the valve seated.

WILLIAM ROBERT BREEDS.