March 25, 1930. W. VAHL 1,752,043

SAFETY GAS COCK

Original Filed Jan. 14, 1928

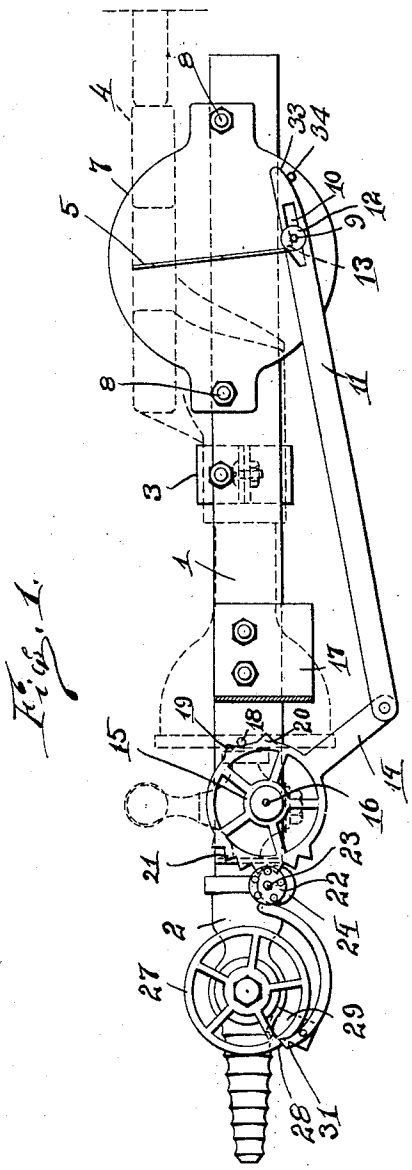


Fig. 1.

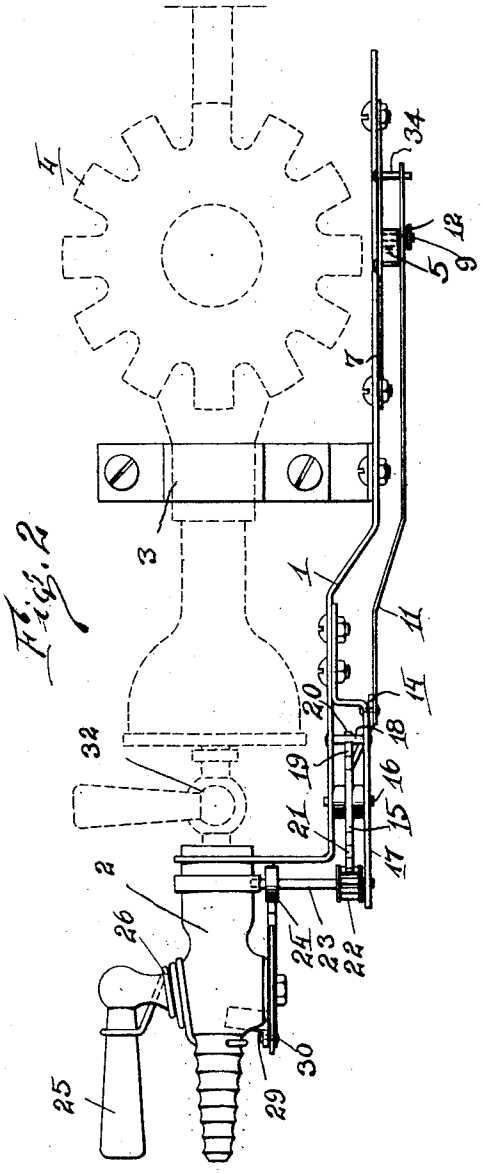


Fig. 2.

Inventor

William Vahl

By Frank Kaipes

Attorney

Patented Mar. 25, 1930

1,752,043

UNITED STATES PATENT OFFICE

WILLIAM VAHL, OF ROCHESTER, NEW YORK

SAFETY GAS COCK

Application filed January 14, 1928, Serial No. 246,825. Renewed January 13, 1930.

This invention relates to thermostatic gas shut-off mechanism for automatically controlling a gas shut-off valve and the invention has for its object to provide a simple, inexpensive and efficient apparatus that can be readily attached to the ordinary gas burner so that the flow of gas to the burner is automatically shut off whenever the burner flame is accidentally extinguished.

This and other objects of this invention will be fully illustrated in the drawing, described in the specification and pointed out in the claims at the end thereof.

In the accompanying drawing:

Figure 1 is a side elevation of the thermostatic gas shut-off mechanism as it appears when attached to an ordinary gas burner.

Figure 2 is a top plan view of the thermostatic shut-off mechanism and gas burner to which it is attached.

In the several figures of the drawing like reference numerals indicate like parts.

The apparatus forming the subject matter of this invention is both simple in construction and operation and is made so as to be readily applicable to all types of gas burners such as are used in gas stoves, gas heaters etc. where it is desirable to have the gas supply automatically shut off whenever the burner flame is accidentally extinguished. The manufacturing cost of the apparatus is furthermore small so that its sales price will not make the use of the apparatus prohibitive.

As illustrated in the figures of the drawing, the supporting frame 1 is bent up of sheet metal and its forward end engages and is supported by the gas supply pipe or the shut-off valve 2. The rear end of the frame 1 is supported by the clamp 3 which is attached to the inside of the frame 1 and fastens around the inlet of the gas burner 4. The frame 1 extends along one side of the gas burner so that the moving parts of the apparatus can be readily mounted thereon without interference with the operation and use of the burner.

The thermostatic needle 5 which controls the opening and closing of the shut-off valve 2 is mounted on the vertical circular plate 7 which is fastened to the right hand end of the frame 1 by means of suitable bolts 8, 8. This needle is made up in the form of a flat spring and its upper end is suitably anchored on the outer side of the plate 7 to allow the body of the needle to freely flex back and forth on the heating and cooling of it. At the lower end the thermostatic needle 5 carries the pin 9. This pin passes thru the slot 10 provided in the rear end of the link 11 and is held in engagement in the slot by a suitable washer 12 that is fastened to the outer end of the pin. The slot is enlarged at the left hand end and a shoulder 13 is formed by this enlargement at the upper edge of the slot. On the heating of the thermostatic needle by the flame of the gas bruner the needle flexes to the left so that the pin 9 slides forward in the slot 10 until it has reached the enlargement of it which allows the link to drop so that the pin engages behind the shoulder 13.

The left hand end of the link 11 is pivotally attached to the arm 14 projecting from the periphery of the mutilated gear 15. This gear is mounted to oscillate on the pin 16 one end of which is pivotally mounted in a bearing in the bracket 17 that is fastened to the frame 1, and the other end of which is mounted in a bearing formed in the frame 1 proper. A stationary pin 18 extends between the bracket 17 and the frame 1 close to the perimeter of the mutilated gear 15 and between the teeth 19 and 20 that project from the periphery so that the movement of the mutilated gear is limited by the distance between the teeth 19 and 20 and the engagement of the pin 18 with either of these teeth.

The series of consecutive teeth 21, 21 are adapted to mesh with the pinion 22 which is carried on the shaft 23. This shaft is mounted to rotate between the bracket 17 and a suitable bearing provided in the body of the shut-off valve 2. On the shaft 23 is also mounted the eccentric 24 so that it will rotate whenever the pinion 22 is rotated by the mutilated gear 15.

The handle 25 of the shut-off valve 2 is normally held in a closed position by the coil spring 26 which encircles a portion of the body of the valve and has one end anchored thereto while the other end is anchored to

the handle 25. To the bottom of the valve is fastened the ratchet wheel 27 which is provided with but one ratchet tooth 28 in the perimeter thereof. On the body of the shut off valve is also provided a bracket 29 which carries the pivot pin 30 on which the curved pawl 31 is mounted to swing. The end of the curved extension of this pawl makes frictional contact with the periphery of the eccentric 24 whenever the shut off valve is opened as the turning of the valve brings the ratchet tooth of the ratchet wheel 27 in position where the pawl 31 can engage this tooth by rocking on the pivot pin 30. On the engagement of the pawl 31 with the tooth 28 of the ratchet wheel, the valve is held open so that gas is supplied to the burner thru its regulating valve 32.

When the gas passing thru the burner is ignited, the flame of the burner heats the circular plate 7 and the thermostatic needle 5 mounted thereon. This causes the needle to flex to the left as above described so that the pin carried at the bottom of the thermostatic needle moves in the slot 10 behind the shoulder 13 provided therein. As long as the flam of the burner keeps on burning the different parts of the mechanism will be in the position illustrated in the figures except that the pin 9 carried by the thermostatic needle is moved in place behind the shoulder 13 of the slot 10 as above pointed out.

When, however, the flame of the burner is accidentally extinguished, the thermostatic needle will quickly cool off and in so doing flex back to the right. As it flexes back, the needle will pull the link 11 with it by reason of the engagement of its pin 9 with the shoulder 13. The rearward movement of the link 11 turns the mutilated gear 15 through the arm 14 which in turn rotates the pinion 22 and the eccentric 24. The movement of the eccentric 24 against the rear end of the pawl lever causes the pawl 31 to disengage from the ratchet tooth of the ratchet wheel so that the spring tension of the coil spring 26 is free to turn the handle 25 of the shut off valve and close the valve. In this way the extinguishing of the flame of the burner will cause the shut off valve to be closed so that no more gas can flow to the burner until the shut off valve is manually operated to open the valve.

In order to disengage the pin 9 of the thermostatic needle from the shoulder 13 after the shut off valve has been operated, the rear end of the link 11 is provided with the inclined cam surface 33 which is adapted to slide up on the pin 34 on the rearward motion of the link. The pin 34 is anchored in the circular plate 7 and as the inclined cam surface of the link slides up on the pin 34 the rear end of the link is gradually raised until finally the shoulder 13 of the slot is disengaged from the pin of the thermostatic needle. When this happens the weight of the link 11 and the arm 14 will cause the link and the arm to move back to the left by force of gravity and in doing so turn the mutilated gear, the pinion and eccentric and move the eccentric surface away from the end of the pawl lever until it is again brought in contact therewith the next time the shut-off valve is turned on and the pawl 31 can engage the ratchet tooth of the ratchet wheel.

I claim:

1. In an automatic shut-off mechanism for gas burners, the combination with a burner and a regulating valve, of a shut-off valve, a supporting frame supported by said burner, a vertical heating plate carried by said supporting frame at one end thereof and held on one side of the burner, a thermostatic needle mounted on the side of said vertical heating plate, a ratchet wheel carried by said shut-off valve, a pawl adapted to engage said ratchet wheel and hold said shut off valve in the open position, an eccentric adapted to engage said pawl and means for rotating said eccentric to rock said pawl and release said ratchet and said shut off valve, spring means adapted to operate said valve on the release of said ratchet, means for rotating said eccentric, a connecting link connecting said rotating means with said thermostatic needle, said link having a slot therein, a shoulder formed in the upper edge of said slot, a pin carried at the lower end of said thermostatic needle and engaging into said slot in said link and adapted to be moved in said slot into engagement behind said shoulder to pull said link on the flexing of said needle in one direction, and means adapted to automatically disengage said pin from said shoulder in said slot at the end of the movement of said link caused by the flexing of said needle.

2. In an automatic shut-off mechanism for gas burners, the combination with a gas burner of a shut-off valve, a ratchet wheel carried on said valve, a pawl engaging said wheel to lock said valve in open position, means for closing said valve on the release of said ratchet wheel, a thermostatic needle, a mutilated gear having an arm thereon and a link connected thereto and a pinion meshing with said gear by which the movement of the thermostatic needle is transmitted in one direction to said pawl.

In testimony whereof I affix my signature.

WILLIAM VAHL.