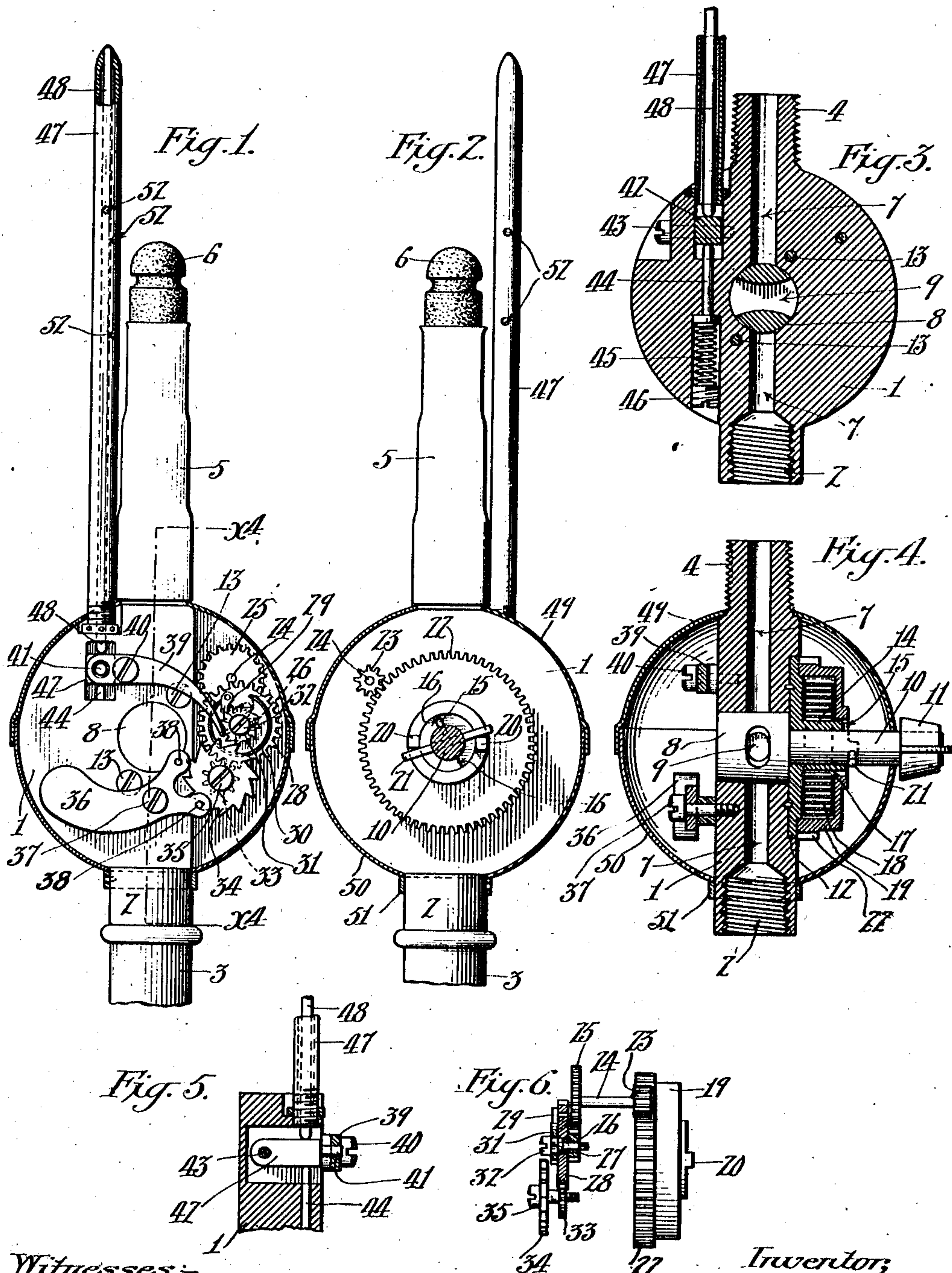


J. W. DEARING.
SAFETY BURNER.

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955,949.

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UNITED STATES PATENT OFFICE.

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SAFETY-BURNER.

955,949.

Specification of Letters Patent.

Patented Apr. 26, 1910.

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To all whom it may concern:

Be it known that I, JOSEPH W. DEARING, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Safety-Burner, of which the following is a specification.

This invention relates to burners for burning gas or liquid, and the object of the invention is to provide means for automatically closing the valve and shutting off the fuel should the flame become accidentally extinguished.

The automatic mechanism for closing the valve is controlled by a novel form of thermostat shown and described in a previous application of mine filed May 22, 1908, Serial #434414, which thermostat, in the present case, when cool, unlocks the automatic closing mechanism so that the valve will be closed thereby, and another object of the invention is to provide means for automatically retarding the closing movement of the valve so that in lighting the burner when the thermostat is cool, the valve will be retarded in its closing movement and will not have time to close more than part way before the thermostat will become heated and cause the closing mechanism to be locked against further closing movement, so that it will not be necessary for a person in lighting the burner to manually hold the valve open until the thermostat becomes heated. As soon as the thermostat has become heated and locked the closing mechanism the valve is free to be set in any desired position, according to the amount of flame desired, and will remain set in such position unless the flame becomes extinguished and allows the thermostat to cool.

The accompanying drawings illustrate the invention, and referring thereto:

Figure 1 is a side elevation of the burner with the spherical inclosing case in section. Fig. 2 is a view similar to Fig. 1, of the reverse side. Fig. 3 is a longitudinal section through the body of the burner and adjacent portion of the thermostat. Fig. 4 is a section on line x^4-x^4 of Fig. 1. Fig. 5 is a vertical section through a portion of the burner body, showing the relation of the lever, thermostat rod, and spring actuated plunger. Fig. 6 is a side elevation of the train of gears, omitting the burner body for clearness.

The burner comprises a circular body 1 having an internally threaded stem 2 at one end which enables the burner to be screwed to the service pipe 3. At the other end of the body is a stem 4 on which is screwed the tube 5 having tip 6. The body 1 and stems 2 and 4 are preferably a single casting having a central fuel passage 7. The body 1 has a central valve seat in which is a tapered valve 8 having a diametrical fuel passage 9 and provided with a valve stem 10 on the outer end of which is a wing nut 11 for turning the valve.

As shown in Fig. 4 the body 1 is recessed to receive a disk 12 which is held in place and prevented from turning by two screws 13. The disk 12 has a sleeve 14 through which the valve stem 10 passes and a pin 15 on the valve stem limits the rotation of the valve to about half a revolution by striking either of two shoulders 16 on the sleeve 14 as shown in detail in Fig. 2. The sleeve 14 has a notch 17 which is engaged by the inner end of a spiral spring 18 which is housed within a winding drum 19, the outer end of the spring being engaged with the winding drum. The winding drum has two lugs 20 which are engaged by a pin 21 on the valve stem to wind the drum when the valve is turned, and permit about a half a revolution of the valve independent of the drum to enable the valve to be set as desired after the closing mechanism has been locked due to the heating of the thermostat as will be described.

The winding drum 19 has a gear 22 which meshes with a pinion 23 on a shaft 24 which extends through the body 1, and a gear 25 on the other end of shaft 24 meshes with a pinion 26 fixed on a hollow arbor 27. Loose on the arbor 27 is a gear 28 having a pawl 29 which is held by a spring 30, in engagement with a ratchet 31 fixed on the arbor 27. A shaft 32 is screwed to the body 1 and arbor 27 is journaled thereon. The gear 28 meshes with a pinion 33 which is fixed to an escapement wheel 34 journaled on a shaft 35 screwed to the body 1. A weighted escapement lever 36 is pivoted at 37 to the body 1 and has pallets 38 which coact with escapement wheel 34 to retard the movement of the train of gearing, when actuated by the spring 18. A detent 39, pivoted at 40 to the body 1, is engaged by a stud 41 on the end of a lever 42 pivoted to a screw 43 and

the pivot 40 is located close to a stud 41 so that a very slight movement of stud 41 will cause a considerable movement of the end of the detent 39, sufficient to cause the detent to engage or disengage the escape wheel 34.

The lever 42 is under spring tension produced by a plunger 44 pressed by a coil spring 45 confined by a screw plug 46. The lever 42 is controlled by a thermostat comprising an outer brass tube 47 which is fixed at one end to the body 1. Within the tube 47 is a steel rod 48 the outer end of which is fixed to the outer end of the tube 47 and the inner end of the rod 48 bears against the lever 42. A spherical case incloses the body 1 and mechanism, and comprises an upper hemispherical shell 49 and a lower hemispherical shell 50 held in place by a removable collar 51.

To light the burner valve 8 is turned to admit fuel to the tip 6 and as the valve is turned, pin 21 turns drum 19 and winds the spring 18, the associated train of gearing operating by movement of the drum. Although the fuel may be immediately ignited the thermostat not being hot will overcome the power of the spring 45 and plunger 44 to hold the detent 39 free from escape wheel 34, and thus the train of gearing will commence to run down but it will run down very slowly, being retarded by the escape wheel 34. As the train of gearing thus runs down the valve slowly turns backward but its passage 9 is flared so that full escape of fuel is permitted for a short time, during which the thermostat becomes heated and the tube 47 elongates and draws up the rod 48 thereby allowing springs 45 and plunger 44 to move the detent 39 into engagement with the escape wheel 34 whereupon the train of gearing is arrested from further running down and the valve thus remains

open and is free to be adjusted as desired by simply turning valve stem 10 as the lugs 20 permit nearly a half revolution of the valve without disturbing pin 21 which is sufficient to entirely close the valve, and as the passage 9 of the valve is flared as described a full range of adjustment from maximum flow of fuel to complete stoppage of fuel is possible.

Should the flame become extinguished the thermostat at once cools, which action is accelerated by air holes 52, and as the tube contracts it pushes down the rod 48 which acts on lever 42 to throw detent 39 out of engagement with escape wheel 34, whereupon the train of gearing immediately runs backward, turning the valve, and shuts off flow of fuel.

What I claim is—

A burner and valve therefor, spring operated gearing for turning the valve, an escapement wheel and escapement lever for retarding the gearing, a pivoted detent adapted to engage the escapement wheel, a pivoted lever having a stud engaging the detent near the pivot of the detent, a thermostat comprising a telescopic tube and rod having different coefficients of expansion, the tube being secured to the burner and the rod engaging the tube at one end and its other end bearing against said lever, a plunger slidable in said body in line with said tube, said lever extending between said plunger and rod, and a spring pressing said plunger toward said lever.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 9th day of June 1908.

JOSEPH W. DEARING.

In presence of—

G. T. HACKLEY,
FRANK L. A. GRAHAM.