June 28, 1927. 1,633,589

L. H. LAMONT

THERMOSTATICALLY CONTROLLED HEATING ELEMENT

Filed Feb. 12, 1925 2 Sheets-Sheet 1

FIG 1

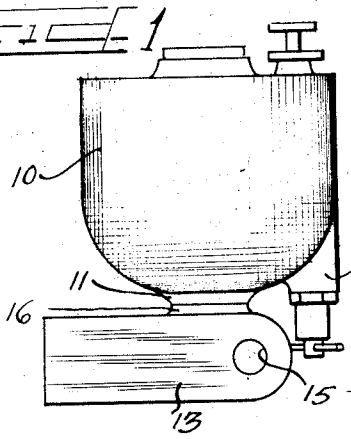


FIG 2

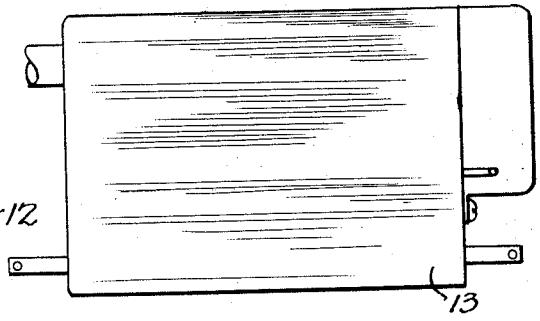


FIG 4

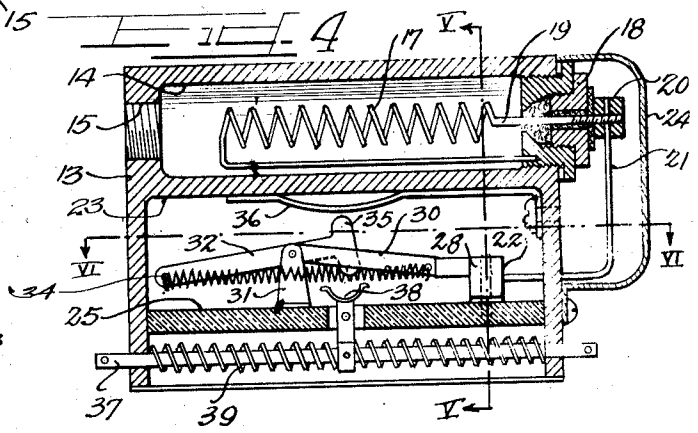


FIG 5

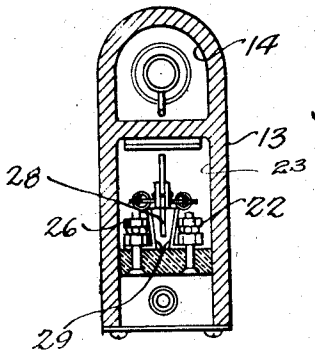


FIG 6.

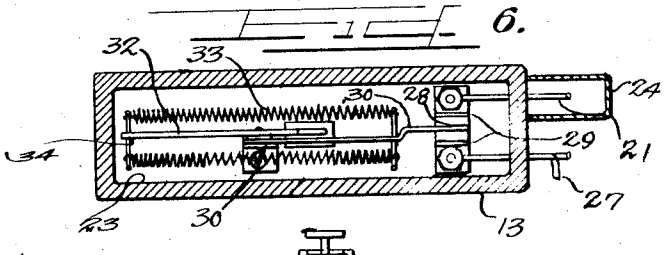


FIG 3

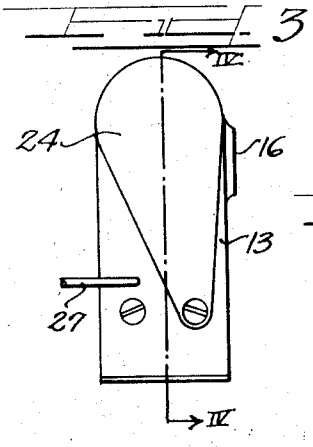
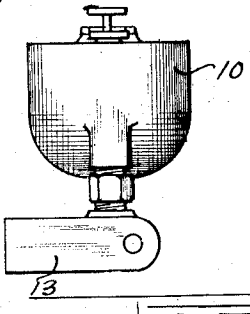


FIG 7



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June 28, 1927. 1,633,589

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THERMOSTATICALLY CONTROLLED HEATING ELEMENT

Filed Feb. 12, 1925 2 Sheets-Sheet 2

FIG 10

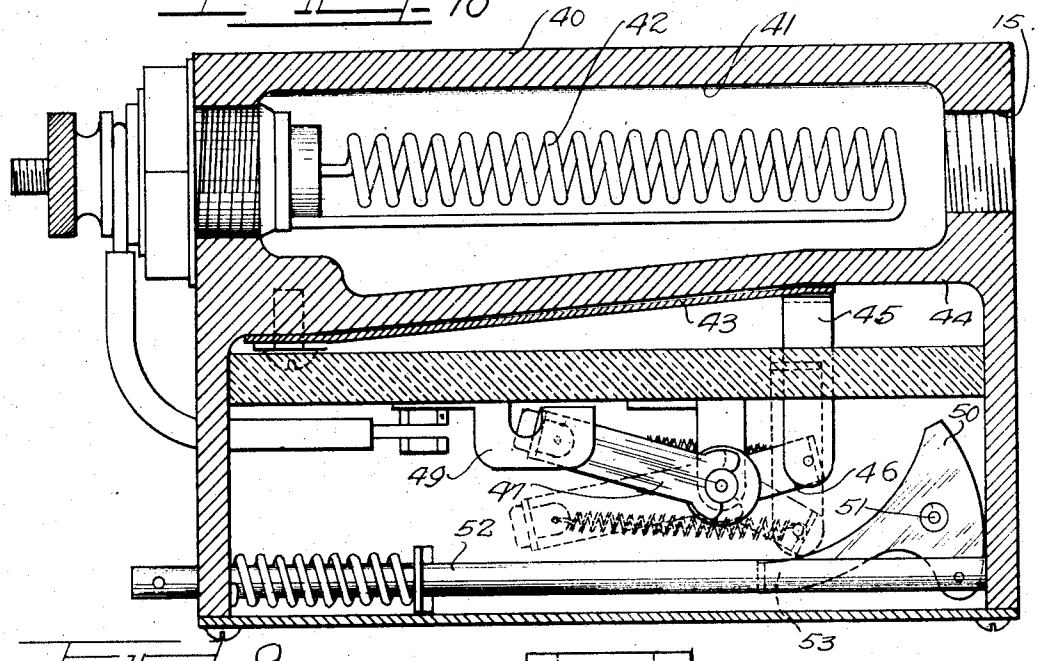


FIG 9

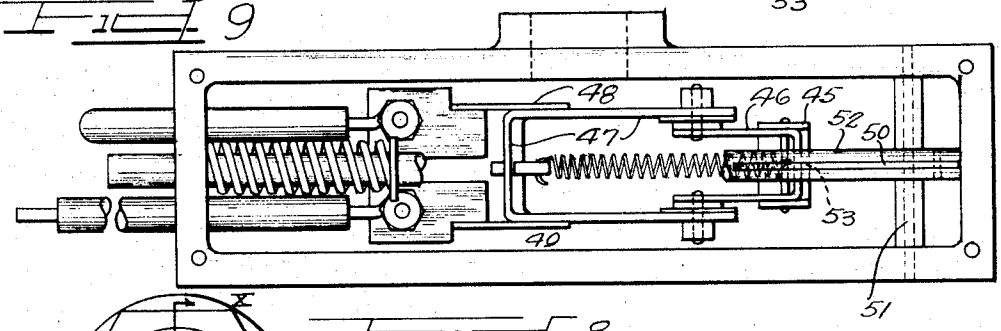
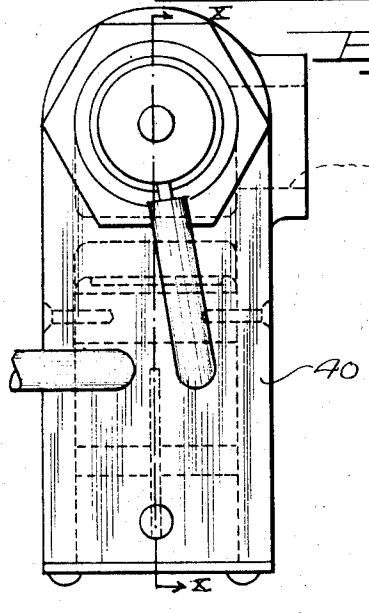


FIG 8



INVENTOR

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Patented June 28, 1927. 1,633,589

UNITED STATES PATENT OFFICE.

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THERMOSTATICALLY-CONTROLLED HEATING ELEMENT.

Application filed February 12, 1925. Serial No. 8,641.

This invention relates to means for heating the fuel supplied to internal combustion engines and particularly to improved means for permanently disconnecting the heating element upon reaching a predetermined temperature.

It is an object of this invention to provide an improved fuel heating system adapted to assist in starting internal combustion engines by rendering the fuel supply more easily vaporizable.

It is also an object of this invention to provide a thermostatically controlled snap-over switch adapted to insure a full opening and closing of the switch.

It is a further object of this invention to provide a manual control for said switch operable in either direction.

Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawings.

This invention (in a preferred form) is illustrated in the drawings and hereinafter more fully described.

On the drawings:

Figure 1 is an assembly view of this device applied to the fuel inlet of the carburetor float chamber.

Figure 2 is a slightly enlarged bottom view thereof.

Figure 3 is an end view from the right side of Figure 2.

Figure 4 is a section on the line 4—4 of Figure 3.

Figure 5 is a section on the line 5—5 of Figure 4.

Figure 6 is a section on the line 6—6 of Figure 4.

Figure 7 is an assembly view showing the device applied to the drain out opening of the carburetor float chamber instead of to the fuel inlet as in Figure 1.

Figure 8 is an end view of a modified form of this invention.

Figure 9 is a bottom view thereof with the cover removed to show the switch mechanism.

Figure 10 is a section on the line 10—10 of Figure 8.

As shown on the drawings:

A carburetor float chamber is indicated by the numeral 10, the fuel inlet boss 11 and a drainage outlet 12 being also indicated. The particular form of float chamber is immaterial to this invention, as is the form of carburetor itself, so that only enough of this structure is shown to illustrate the attachment of the device of this invention.

A casing 13 is divided into two chambers, a fuel chamber 14 having an inlet connection 15 for the fuel and an outlet connection 16 to attach to the float chamber. It is to be understood that either connection may be plugged and the other connected to the float chamber to transform the device into a heating reservoir as shown in Figure 7, or either connection may be used as an inlet and the other as an outlet if the device is inserted in the fuel line independently of the carburetor float chamber.

The fuel chamber 14 contains an electrical resistance coil 17 mounted in an insulated bushing 18 and having one end grounded to the casing. The live end 19 of the coil 17 terminates in a binding post 20 from which a wire 21 leads to a switch terminal 22 within the second or thermostatic switch chamber 23 in the casing. An enclosing shield 24 serves to cover that part of the wire 21 outside the casing. The switch chamber contains an insulating switch supporting base 25 on which is mounted the switch terminal 22 and a second opposed terminal 26 to which the incoming electrical conductor 27 is attached. The switch blade 28 comprises a wedge shaped block which contacts spring surfaces 29 associated with each terminal to close the circuit through the heating coil to the ground.

An extension 30 of the switch blade 28 is pivoted to a bracket 31, the pivot point being disposed in a line midway between the open and closed positions of the switch blade proper. A second lever member 32 is pivoted to the bracket 31 and springs 33 connect the outer end of the stem 34 with a cross bar secured to the switch blade 28, the whole assembly together with the springs forming a snap over mechanism assuring complete movement of the switch blade into either open or closed position and retaining the blade in such a position. A vertical cross member 35 is formed on the inner end of the lever member 32, the cross member having rounded ends for easy engagement with the operating parts. A bowed strip of thermostatic metal 36 is secured at one end to normally lie against the division wall

between the fuel and switch chambers, the bowed part of the thermostat in its cool form approaching the upper end of the cross member 35 but permitting complete closure of the switch with the springs approximately horizontal.

A longitudinally movable rod 37 is journalled in the casing below the switch base 25 and serves to actuate a fork-like member 38 pivoted in an aperture in the base 25 and adapted to force the lower end of the cross member 35 upwardly when the rod 37 is moved either way. Springs 39 on the rod serve to normally position the rod and fork in neutral position.

The slightly modified embodiment of the invention, as shown in Figures 8 to 10, differs only slightly from the foregoing. The casing 40 is provided with the heating chamber 41 having a heating element 42 inserted therein as before, a flat strip thermostat 43 in the lower chamber 44 of the casing serving to actuate a stirrup 45 engaging the end 46 of a snap-over mechanism 47 serving as a switch closing device between the terminals 48 and 49. Manual operation of the switch is provided for by the cam 50 pivoted at 51 and rotated about this pivot by pulling on the spring restrained rod 52 which lifts the toe 53 of the cam under the end 46 of the switch mechanism when the switch is in open position and carries the switch past dead center.

The operation:

The heating element is intended to bring the fuel supply in the carburetor float chamber up to a temperature where the fuel is more readily vaporizable and to accomplish this result the fuel may be passed through the heating chamber on its way to the float chamber as in Figure 1 or the fuel chamber may serve as a heating reservoir attached to the float chamber to bring the temperature thereof to the desired point without necessarily feeding the fuel past the heating element, an arrangement shown in Figure 7.

The snap switch controlling the heating element is moved from the position shown in Figure 4 to open the circuit by the expansion of the thermostatic metal strip which pushes down on the cross member 34 thus elevating the free end of this lever until the point of spring attachment passes above a line through the pivot and the spring attachment to the switch blade. Up to this point the switch remains closed due to the spring tension, but after passing this point the springs snap the switch open. With the switch in open position the lower end of the cross member 34 rests in the fork of the member 38. Tilting of this member either way then serves to force the cross member upwardly, producing an action the reverse of that described in opening the switch. It will thus be seen that the switch can be closed by a movement of the rod 37 either way and the switch will remain closed until the thermostat reaches a temperature sufficient to actuate the snap over action, when the switch remains open until manually closed again.

I am aware that many changes may be made, and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted hereon, otherwise than necessitated by the prior art.

I claim:

1. A fuel heating device comprising an electrical heating element, a switch controlling said heating element, a snap-over mechanism controlling said switch, and a thermostat adapted to actuate said snap-over mechanism to open the switch at a predetermined temperature.

2. A fuel heating device comprising an electrical heating element, a switch controlling said heating element, a snap-over mechanism controlling said switch, a thermostat adapted to actuate said snap-over mechanism to open the switch at a predetermined temperature and means operable by the user adapted to close the switch.

3. A fuel heating device comprising an electrical heating element, a switch controlling said heating element, a snap-over mechanism controlling said switch, a thermostat adapted to actuate said snap-over mechanism to open the switch at a predetermined temperature, and a dash control adapted to actuate the snap-over mechanism to close the switch.

4. A device of the class described comprising a double chambered casing, an electrical heating element in one of said chambers, fuel connections thereto, a switch in the other of said chambers, a snap-over mechanism for operating said switch and a thermostat for opening said switch at a predetermined temperature.

5. A device of the class described comprising a double chambered casing, an electrical heating element in one of said chambers, fuel connections thereto, a switch in the other of said chambers, a snap-over mechanism for operating said switch, a thermostat for opening said switch at a predetermined temperature, and means adapted to close said switch at will.

6. A device of the class described comprising a double chambered casing, an electrical heating element in one of said chambers, fuel connections thereto, a switch in the other of said chambers, a snap-over mechanism for operating said switch, a thermostat for opening said switch at a predetermined temperature, means engaging said snap over mechanism when the switch is open and manually actuated means for moving said

engaging means adapted to force the snap-over mechanism past its dead point.

7. The combination with a carbureter, of a fuel heating device forming a part thereof and comprising a chambered casing, a heating element therein, fuel connections thereto, a snap-over switch also disposed in said casing, and a control mechanism for the switch adapted to actuate the same at a predetermined temperature.

In testimony whereof I have hereunto subscribed my name.

LEWIS H. LAMONT.