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S. J. WOODS

GAS IGNITING DEVICE

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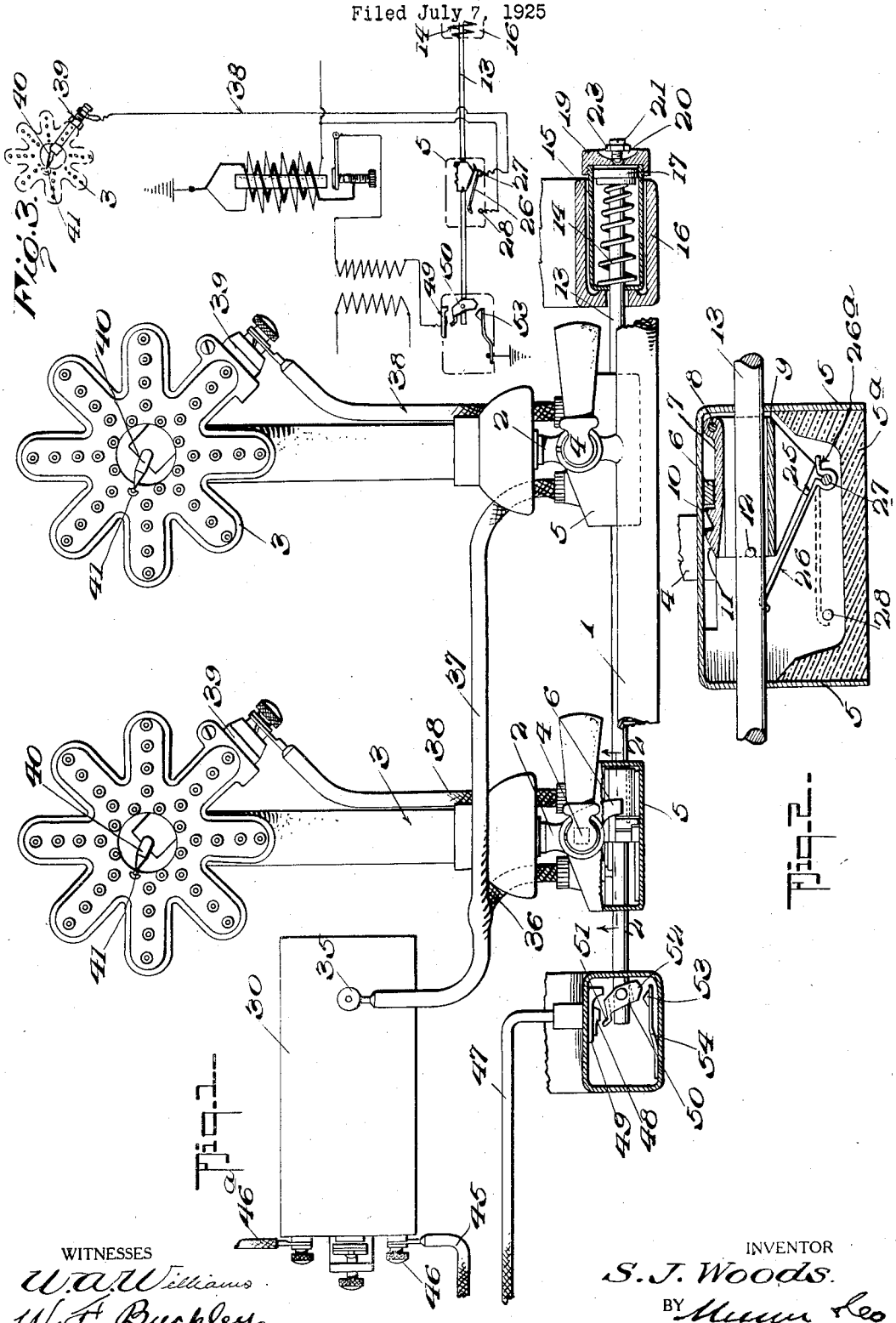

Fig. 2.

Fig. 3.

WITNESSES

W. A. Williams

W. F. Buckley

INVENTOR

S. J. Woods.

BY Munn & Co

ATTORNEYS

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SAMUEL JOSEPH WOODS, OF NEWPORT, RHODE ISLAND.

GAS-IGNITING DEVICE.

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This invention relates to an electric gas lighter which is adapted to use the ordinary house lighting electric current as well as battery current.

The object of the invention is to provide an electric gas lighter of this character especially designed for use with gas stoves and which automatically ignites the gas at the burner when the burner is turned on.

A further object resides in the provision of a device of this character which is so constructed and organized as to close automatically the keys or valves leading to the burners unless the keys or valves are first opened fully thereby preventing children from allowing gas to escape from the stove, the device, however, being of such a character that the intensity of the gas flame may be regulated after the key has been once turned on full to effect ignition.

A still further object resides in the provision of an automatic electric gas lighter having these advantages and capacities and which is of simple and durable construction, reliable, safe and effective in operation and easy and comparatively inexpensive to manufacture.

Other objects and advantages reside in certain novel features of the construction, arrangement and combination of parts which will be hereinafter more fully described and particularly pointed out in the appended claims, reference being had to the accompanying drawings, forming a part of this specification, and in which

Figure 1 is a fragmentary view partly in plan and partly in horizontal section showing the invention applied on the burners of a gas stove,

Figure 2 is a view in section on line 2—2 of Fig. 1, and Figure 3 is a diagrammatic view.

Referring to the drawings the numeral 1 designates a gas supply pipe having branches 2 supplying gas to burners 3 in the usual manner. Valves or keys 4 are incorporated in the branches 2 to control and regulate the supply of gas to the burners. All of the construction thus far described is conventional and needs no detail description.

The present invention proposes the provision of a housing 5 adjacent to and partially enclosing each valve 4. On the plug or turning part of each valve 4 a curved arm 6 is fixed and as shown each arm 6 operates in the housing which encloses its valve.

Each arm 6 coacts with a latch 7 pivoted as at 8 to a carriage 9, the latch being spring pressed into engagement with its arm. Each latch 7 has a shoulder 10 with which the arm 6 is engageable and also has a beveled end 11 to permit resetting as will hereinafter more clearly appear.

Each carriage 9 is mounted in its housing 5 for sliding movement and embraces and is secured by a pin 12 to a main control rod 13 which is slidably fitted through openings provided therefor in all of the casings 5. By virtue of this arrangement when any key or valve 4 is turned to turn on the supply of gas to the burner which it controls, the rod 13 will be moved to the left as viewed in Figs. 1 and 2.

The main control rod 13 is biased to the position shown in Fig. 1 in which position the valves 4 are closed and this biasing of the rod 13 is preferably accomplished by means of a coil spring 14 encircling the rod 13 adjacent one end thereof. One end of the spring 14 abuts an end wall of a dash pot cylinder 15, said cylinder 15 being fixedly mounted on a suitable supporting bracket 16. The other end of the spring 14 abuts a piston 17 fixed on the rod 13 and operatively fitted in the cylinder 15. The spring 14 is tensioned to bias the rod 13 as stated. The dash pot constituted in part by the cylinder 15, and the piston 17 is completed by a head plate 19 suitably connected to the cylinder 15 and having an escape port 20 therein controlled by an adjustable needle valve 21. By adjusting the needle valve 21 the resistance which it presents to the escape of air to the atmosphere through the port 20 may be varied. As shown the needle valve is threadedly mounted in the head plate and is held in position by means of a lock nut 23. The head plate is formed with a slot and opening which co-act with the needle valve.

Each carriage 9 has a cam 25 which shifts and controls a switch arm 26 pivoted as at 27 on the casing 5^a and cooperable with a fixed contact pin 28. The part 5^a of the casing 5 on which the switch arm 26 and contact pin 28 are mounted is made of non-conducting material.

The switch constituted by the arm 26 and contact pin 28 is incorporated in the high tension or secondary circuit provided for each burner. The ignition system includes

a box 30 having a conventional vibrator spark coil therein. The secondary winding of the spark coil is connected to a binding post 35 from which the high tension wires 36 and 37 lead to the contact pins 28. Wires 38 are electrically connected with the switch arms 26 and lead to sparking devices 39. Each sparking device 39 has an electrode 40 which is disposed in cooperative relation with respect to a conducting metal boss 41 partially surrounding one of the orifices of the burner with which the sparking device is associated. The spark gap thus constituted extends across one of the jets of the burner to insure ignition whenever a spark is produced. Of course the burners are grounded on the frame.

A positive lead 45 from the house current from the battery or from any other source of supply is connected to a binding post 46 on the box 30. If alternating current is supplied as house current a step down transformer is interposed between the binding post and the primary winding of the spark coil whereas if direct current is used a resistance element replaces the transformer. The transformer or resistance element used may be conveniently housed in the box 30 with the spark coil. The secondary winding of the spark coil is grounded on the frame of the stove by means of a wire 46^a having a suitable ground connection to the frame.

The negative lead 47 of the source of current is electrically connected to a fixed contact 48 mounted on an insulating block 49 carried by the frame of the stove so that the contact 48 is insulated from the frame of the stove. A circuit maker and breaker 50 is pivoted on the main control rod 13 and has a lip 51 cooperable with the fixed contact 48 and also has a tapered end 52 cooperable with a tapered contact 53 yieldably mounted on and electrically connected to or rather grounded on the frame by means of a spring metal arm 54.

When a key 4 is turned on its arm 6 coacts with the shoulder 10 of the latch 7 to shift the latch 7 and the carriage 9 to left as viewed in the figures of the drawing thereby causing the cam 25 of the carriage to shift the arm 26 to engage the contact pin 28 and complete the secondary or high tension circuit except for the spark gap. During this movement of rod 13 the pivoted circuit maker 50 plays idly over the contact 53 but does not engage the contact 48. When the key 4 has been fully opened the arm 6 has traveled past and out of engagement with the shoulder 10 of the latch whereupon the spring 14 moves the rod to the right as viewed in the drawing. This movement of the rod causes the beveled end 52 of the circuit maker and breaker to engage the tapered contact 53 following which the circuit maker and breaker 50 swings on its pivot to cause the lip 51 to engage the fixed contact 48 to complete the primary circuit. The current flows through the positive lead 45, the binding post 46, the step down transformer or the resistance element as the case may be, then through the primary winding P of the spark coil to wire 46^a, through the frame to the arm 54 and its contact 53, across the circuit maker and breaker 50 to the fixed contact 49 and thence to the negative lead 47. This induces current flow in the high tension circuit which includes the secondary winding W of the spark coil, the wire 36 or 37 depending upon which burner is used, the contact pin 28, the arm 26, the wire 38 and the sparking device. In this way a series of sparks is caused to play across a jet of the burner to ignite the gas issuing therefrom. The return of the rod 13 is retarded by the action of the dash pot so that sufficient sparking is insured.

As the rod completes its return movements the cam 25 engages an extension 26^a on the switch arm 26 to swing the switch arm out of engagement with the contact 28 to break the high tension circuit and the tapered end 52 of the circuit maker and breaker snaps past the contact 53 to break the primary circuit.

After any key 4 has been fully turned on its arm 6 is no longer engaged with its latch 7 and the key may be turned back to regulate the flow of gas. When the key is turned off its arm 6 rides over the beveled end 11 of its latch to reset the device. Should a key be only partially turned on in the first instance it will be turned off automatically by the spring 14 and no gas will flow nor will any spark be produced.

I claim:

1. An electric lighter for the burners of gas stoves having valves regulating the supply of gas thereto, an electrical ignition system including a primary circuit and a secondary circuit, a sparking device associated with each burner of the stove, said sparking devices being embodied in the secondary circuit of the ignition system, and means including a single circuit maker and breaker arrangement separate from and independent of the electrical ignition system operable from any of the valves for making and breaking the currents when any valve is turned on.

2. An electric lighter for the burners of multiple burner gas stoves having rotatable valves regulating the supply of gas thereto, an electrical ignition system including a primary circuit and a secondary circuit, a sparking device associated with each burner of the stove, said sparking devices being embodied in the secondary circuit of the ignition system, and means operable from any of the valves for making the currents

when any valves are turned on and comprising a main control bar, means between each valve and the bar for shifting said bar when any valve is turned on, a switch in the secondary circuit, controlled from said bar, and a circuit maker and breaker in the primary circuit also controlled from the bar.

3. An electric lighter for the burners of gas stoves having rotatable valves regulating the supply of gas thereto, an electrical ignition system including a primary circuit and a secondary circuit, a sparking device associated with each burner of the stove, said sparking devices being embodied in the secondary circuit of the ignition system, and means operable from any of the valves for making the currents when any valve is turned on and comprising a slidable main control rod, a carriage fixed on the rod adjacent each valve and having a spring pressed latch, an arm fixed to each valve and cooperable with the latch of its carriage, said carriage having a cam controlling the switch in the main circuit, said circuit maker and breaker being pivoted to the rod, said primary circuit having contacts with which the circuit maker and breaker coats.

4. An electric lighter for the burners of gas stoves having rotatable valves regulating the supply of gas thereto, an electrical ignition system including a primary circuit and a secondary circuit, a sparking device associated with each burner of the stove, said sparking devices being embodied in the secondary circuit of the ignition system, and means operable from any of the valves for making the currents when any valve is turned on and comprising a slidable main control rod, a carriage fixed on the rod adjacent each valve and having a spring pressed latch, an arm fixed to each valve and cooperable with the latch of its carriage, said carriage having a cam controlling the switch in the main circuit, said circuit maker and breaker being pivoted to the rod, said primary circuit having contacts with which the circuit maker and breaker coacts, said circuit maker and breaker having a tapered end and a lip, the lip being cooperable with one of the contacts of the primary circuit, the other contact of said primary circuit being yieldably mounted and cooperable with the tapered end of the circuit maker and breaker.

5. An electric lighter for the burners of gas stoves having rotatable valves regulating the supply of gas thereto, an electrical ignition system including a primary circuit and a secondary circuit, a sparking device associated with each burner of the stove, said sparking devices being embodied in the secondary circuit of the ignition system, and means operable from any of the valves for making the currents when any valve is turned on and comprising a slidable main control rod, a carriage fixed on the rod adjacent each valve and having a spring pressed latch, an arm fixed to each valve and cooperable with the latch of its carriage, said carriage having a cam controlling the switch in the main circuit, said circuit maker and breaker being pivoted to the rod, said primary circuit having contacts with which the circuit maker and breaker coacts, said circuit maker and breaker having a tapered end and a resilient lip, the resilient lip being cooperable with one of the contacts of the primary circuit, the other contact of said primary circuit being yieldably mounted and cooperable with the tapered end of the circuit maker and breaker, said rod closing the switch when moved in one direction by any of the arms of said valves, a spring for returning the rod, and a dash pot for retarding return movement of the rod, said circuit maker and breaker being closed in the return movement of said rod.

6. An electric lighting device for multiple burner gas stoves comprising gas burners, gas valves, a jump spark coil, and a single means separate from and independent of the jump spark coil operated by said gas valves for igniting the gas at any burner when the valve controlling the flow of gas to it is opened.

SAMUEL JOSEPH WOODS.