

## Description

### Gas Valve Timing Shut-off Device for Gas Stove

#### 5    **Technical Field**

The present utility model relates to a gas valve timing shut-off device for gas stove.

#### **Background Art**

The gas stove currently used does not have the gas timing shut-off function;  
10    when cooking soup or porridge takes a long time, people need to watch beside the stove, and it is inconvenient.

#### **Description of the Utility Model**

The utility model aims to overcome defects existing in the prior art and provide a gas valve timing shut-off device for gas stove which can set the  
15    required use time by itself, shut off the breathable valve of gas stove at the set time, and work reliably and safely.

To achieve the above-mentioned object, the utility model is achieved in such a way that, it is a gas valve timing shut-off device for gas stove, characterized in that it comprises:

20    A DC stabilized power supply and a voltage feedback circuit; the said voltage feedback circuit receives the DC voltage change value outputted by DC stabilized power supply, and after having the DC voltage change value outputted by DC stabilized power supply processed, outputs it to DC stabilized power supply so as to stabilize the output DC voltage of DC stabilized power supply;  
25    and the DC voltage outputted by DC stabilized power supply provides DC working voltage to the following devices; and

A display driver, key input unit, a LED display, a central processing unit, an alarm, and an execution circuit; wherein, the said display driver receives the time signals inputted by key input unit, and after having the signals processed, outputs

them to the LED display and central processing unit, the said central processing unit, after having the signals inputted by display driver processed, inputs the signals to the execution circuit, the said execution circuit, after having the signals inputted by central processing unit processed, controls the solenoid valves of gas stove, and the display driver also receives the signals inputted by the central processing unit, and after having the signals processed, outputs them to LED display to be displayed.

The said display driver comprises the display driver chip, Capacitors 10-13, Resistors 14-16 and Electrolytic Capacitor 5; the model of the said display driver chip is SM1635, and it totally has 16 pins; the model of the said LED display is LED-4302, and it totally has 10 pins; after the said Capacitor 10, Capacitor 11 and Electrolytic Capacitor 5 are connected in parallel, one end is connected to +5V DC voltage outputted by DC stabilized power supply, Pin 13 of display driver chip and one end of Resistor 16 respectively, and the other end is grounded; the other end of the said Resistor 16 is connected to one end of Resistor 15 and Pin 14 of display driver chip; one end of the said Resistor 14 is connected to Pin 15 of display driver chip, and the other end of Resistor 14 and Resistor 15 are connected to central processing unit respectively; Pin 16 of display driver chip is connected to the output end of key input unit, Pins 2-10 of display driver chip are connected to Pin 4, Pin 3, Pin 1, Pin 9, Pin 8, Pin 7, Pin 6, Pin 5, Pin 2 and Pin 10 of LED display respectively.

The said key input unit comprises the key chip, reset key, Key 1, Key 2, Resistors 18-24, Capacitors 14-17, and Triodes 2-4; wherein, the model of the said key chip is WTC6104ASI, and it totally has 16 pins; the output end of the said reset key is connected to Pin 6 of the key chip through Resistor 20, the output end of the said Key 1 is connected to Pin 5 of the key chip through Resistor 19, and the output end of Key 2 is connected to Pin 4 of the key chip through Resistor 18; after the said Capacitor 14 and Capacitor 15 are connected in parallel, one end is connected to Pin 7 of the key chip, and the other end is

grounded, and Pin 8 of the key chip is also grounded; one end of the said Capacitor 16 is connected to Pin 11 of the key chip and one end of Resistor 24 respectively, and the other end of Capacitor 16 is grounded; one end of Capacitor 17 is connected to the other end of Resistor 24, Pin 1 of the key chip, Pin 12 of the key chip and +5V DC voltage outputted by DC stabilized power supply respectively, and the other end of Capacitor 17 is grounded; Pin 13 of the key chip is connected to the base electrode of Triode 2 through Resistor 21, the emitter electrode of Triode 2 is connected to Pin 6 of the display driver chip, and the collector electrode of Triode 2 is connected to Pin 16 of the display driver chip; Pin 10 of the key chip is connected to the base electrode of Triode 3 through Resistor 22, the emitter electrode of Triode 3 is connected to Pin 7 of the display driver chip, and the collector electrode of Triode 3 is connected to Pin 16 of the display driver chip; Pin 9 of the key chip is connected to the base electrode of Triode 4 through Resistor 23, the emitter electrode of Triode 4 is connected to Pin 8 of the display driver chip, and the collector electrode of Triode 4 is connected to Pin 16 of the display driver chip.

The said central processing unit comprises the master chip, the crystal, Resistors 25-33, Capacitors 18-20 and Electrolytic Capacitor 6; wherein, the model of the said master chip is 2501B, and it totally has 14 pins; one end of the said Resistor 25 is connected to Pin 2 of the master pin, and the other end is connected to the other end of Resistor 14; one end of the said Resistor 26 is connected to Pin 1 of the master pin, and the other end is connected to the input end of the alarm; one end of the said Resistor 27 is connected to Pin 3 of the master pin, and the other end is connected to the other end of Resistor 15; the said Resistor 33, Electrolytic Capacitor 6 and Capacitor 18 are connected in parallel between Pin 4 and Pin 11 of the master pin, Pin 4 of the master pin is also connected to +5V DC voltage outputted by DC stabilized power supply, and Pin 11 of the master pin is grounded; one end of the said Resistor 28 is connected to Pin 14 of the master pin, one end of the said Resistor 29 is connected to Pin 13

of the master pin, one end of the said Resistor 30 is connected to Pin 12 of the master pin, one end of the said Resistor 31 is connected to Pin 10 of the master pin, one end of the said Resistor 32 is connected to Pin 9 of the master pin, and the other end of Resistor 28, Resistor 29, Resistor 30, Resistor 31, and Resistor 32 all are connected to the input end of their respective execution circuit; one end of the said crystal is connected to one end of Capacitor 19 and Pin 6 of the master chip respectively, the other end of the crystal is connected to one end of Capacitor 20 and Pin 5 of the master pin, and the other end of Capacitor 19 and the other end of Capacitor 20 both are grounded.

The said execution circuit comprises the driver chip and Relays 1-5; wherein, the model of the said driver chip is ULN2004, and it totally has 16 pins, Pin 1, Pin 2, Pin 3, Pin 4 and Pin 5 of the driver chip are connected to the other end of Resistor 28, Resistor 29, Resistor 30, Resistor 31, and Resistor 32, and Pin 8 of the driver chip is grounded; Pin 16 of the driver chip is connected to one end of Relay 1, the other end of Relay 1 is connected to +5V DC voltage outputted by DC stabilized power supply, the normally open and normally closed common contact of Relay 1 is connected to one input end of Thermocouple 1, and the other normally open contact of Relay 1 is connected to one end of Solenoid Valve 1; Pin 15 of the driver chip is connected to one end of Relay 2, the other end of Relay 2 is connected to +5V DC voltage outputted by DC stabilized power supply, the normally open and normally closed common contact of Relay 2 is connected to one input end of Thermocouple 2, and the other normally open contact of Relay 2 is connected to one end of Solenoid Valve 2; Pin 14 of the driver chip is connected to one end of Relay 3, the other end of Relay 3 is connected to +5V DC voltage outputted by DC stabilized power supply, the normally open and normally closed common contact of Relay 3 is connected to one input end of Thermocouple 3, and the other normally open contact of Relay 3 is connected to one end of Solenoid Valve 3; Pin 13 of the driver chip is connected to one end of Relay 4, the other end of Relay 4 is

connected to +5V DC voltage outputted by DC stabilized power supply, the normally open and normally closed common contact of Relay 4 is connected to one input end of Thermocouple 4, and the other normally open contact of Relay 4 is connected to one end of Solenoid Valve 4; Pin 12 of the driver chip is connected to one end of Relay 5, the other end of Relay 5 is connected to +5V DC voltage outputted by DC stabilized power supply, the normally open and normally closed common contact of Relay 5 is connected to one input end of Thermocouple 5, and the other normally open contact of Relay 5 is connected to one end of Solenoid Valve 5.

Compared with the prior art, the present utility model has the advantages of: setting the required use time by itself, shutting off the breathable valve of gas stove at the set time, and working reliably and safely.

### **Brief Description of the Drawings**

Fig. 1 is a block diagram for the circuit of the present utility model;

Fig. 2 is a schematic diagram for the utility model's voltage feedback circuit and DC stabilized power supply circuit;

Fig. 3 is a schematic circuit diagram for the utility model's display driver, key input unit, LED display and alarm;

Fig. 4 is a schematic circuit diagram for the utility model's central processing unit, execution circuit, solenoid valve and thermocouple.

### **Description of Specific Embodiments**

The following further describes the specific embodiments of the utility model in conjunction with the accompanying figures. It needs to be noted here that, description of these specific embodiments is used to help to understand the utility model, but it does not limit the utility model. Besides, the technical characteristics involved in each embodiment of the utility model described below can be combined with each other as long as they do not conflict.

In the description of the utility model, the terms from “No. 1” to “No. 53” are used for the purpose of description only, and cannot be understood as indication or implication of relative importance.

As show in Fig. 1, it is a gas valve timing shut-off device for gas stove,  
 5 comprising the DC stabilized power supply 1 and voltage feedback circuit 2; the said voltage feedback circuit 2 receives the DC voltage change value outputted by DC stabilized power supply 1, and after having the DC voltage change value outputted by DC stabilized power supply 1 processed, outputs it to DC stabilized power supply 1 so as to stabilize the output DC voltage of DC stabilized power supply 1; and the DC voltage outputted by DC stabilized power supply 1  
 10 provides DC working voltage to the following devices; and

Display driver 3, key input unit 4, LED display 5, central processing unit 6, alarm 7, and execution circuit 8; wherein, the said display driver 3 receives the time signals inputted by key input unit 4, and after having the signals processed,  
 15 outputs them to LED display 5 and central processing unit 6, the said central processing unit 6, after having the signals inputted by display driver 3 processed, inputs the signals to execution circuit 8, the said execution circuit 8, after having the signals inputted by central processing unit 6 processed, controls the solenoid valves of gas stove, and the display driver 3 also receives the signals inputted by  
 20 central processing unit 6, and after having the signals processed, outputs them to LED display 5 to be displayed.

In working, input the required time signals through the key input unit 4, the display driver 3, after having the signals inputted by key input unit 4 processed, inputs them to the central processing unit 6 and the LED display 5 for displaying,  
 25 the central processing unit 6 inputs the signals to the execution circuit 8, and the execution circuit 8 will work and connect the solenoid valve to ignite, the gas stove can work, and the central processing unit 6 will input the residual time into the display driver 3 constantly, the display driver 3 will input the residual time to the LED display 5 to be displayed, so that people can know the residual time;

when the set time is up, the central processing unit 6 will output the shut-off signals, the execution circuit 8 will not work, and the solenoid valve will be shut off, so as to achieve the object of shutting off the gas valve of gas stove.

As shown in Fig. 2, in this embodiment, the said DC stabilized power supply 1 comprises the fuse FUSE, the piezoresistor ZNR, electromagnetic interference coil EMI, Resistors 1-6 R1-R6, Diodes 1-6 D1-D6, adjustable resistor NTC, Electrolytic Capacitors 1-3 E1-E3, Capacitors 1-5 C1-C5, inductor L and transformer T; wherein, one end of the said FUSE is connected to the live line of the AC mains, and the other end is connected to one end of piezoresistor ZNR, one end of Resistor 1 R1, one end of Capacitor 1 C1, and one input end of electromagnetic interference coil EMI respectively; the other end of piezoresistor ZNR is connected to one end of Resistor 2 R2, the other end of Capacitor 1 C1, the other input end of electromagnetic interference coil EMI and zero line of the AC mains, and the other end of Resistor 1 is connected to the other end of Resistor 2 R2; the said diodes 1-4 D1-D4 constitute a bridge rectifier circuit, two output ends of electromagnetic interference coil EMI are connected to two input ends of the bridge rectifier circuit respectively, one output end of the bridge rectifier circuit is connected to one end of adjustable resistor NTC, and the other output end of the bridge rectifier circuit is connected to the ground and the negative end of Electrolytic Capacitor 1 E1 respectively; after the said Resistor 3 R3, Resistor 4 R4 and Capacitor 2 C2 are connected in parallel, one end is connected to the other end of adjustable resistor NTC, the positive end of Electrolytic Capacitor E1 and Pin 1 of primary coil of Transformer T respectively, and the other end is connected to the negative end of Diode 5 D5, the positive end of Diode 5 D5 is connected to Pin 3 of primary coil of transformer T; after the said Capacitor 3 C3 and Resistor 5 R5 are connected in series, one end is connected to Pin 8 of secondary coil of transformer T, and the other end is connected to the positive end of Electrolytic Capacitor 2 E2, one end of Capacitor 4 C4, one end of Resistor 6 R6 and one end of inductor L respectively,

the negative end of Electrolytic Capacitor 2 E2, the other end of Capacitor 4 C4 and the other end of Resistor 6 R6 all are grounded; the positive end of the said Diode 6 D6 is connected to Pin 8 of secondary coil of Transformer T, and its negative end is connected to the positive end of Electrolytic Capacitor 2 E2; the positive end of the said Electrolytic Capacitor 3 E3 is connected to the other end of inductor L and one end of Capacitor 5 C5 respectively, and the other end of inductor L is the output end of 5V voltage of DC stabilized power supply 1, and the negative end of Electrolytic Capacitor 3 E3 and the other end of Capacitor 5 C5 both are grounded.

As shown in Fig. 2, the said voltage feedback circuit 2 comprises the off-line switch IC1, the silicon controlled rectifier V, Diodes 7 D7, the optical coupling tube OC, Electrolytic Capacitor 4 E4, Resistors 7-13 R7-R13, and Capacitors 6-9 C6-C9; wherein, the model of the said off-line switch IC1 is LNK-364; after the said Resistor 7 R7 and Capacitor 6 C6 are connected in series, one end is connected to Pin 4 of primary coil of Transformer T, and the other end is connected to the positive end of Electrolytic Capacitor E4, the negative end of Diode 7 D7 and one end of Resistor 8 R8 respectively, the negative end of Electrolytic Capacitor 4 E4 is connected to Pin 5 of primary coil of Transformer T and the ground respectively, the positive end of Diode 7 D7 is connected to Pin 4 of primary coil of Transformer T, the other end of Resistor 8 R8 is connected to Pin BP of off-line switch IC1, Pin 4 of optical coupling tube OC and one end of Capacitor 8 C8 respectively; the other end of Capacitor 8 C8 is connected to Pin S of off-line switch IC1 and one end of Capacitor 9 C9 respectively, and Pin D of off-line switch IC1 is connected to Pin 3 of primary coil of Transformer T; Pin 3 of optical coupling tube OC is connected to Pin FB of off-line switch IC1, and Pin 1 of optical coupling tube OC is connected to one end of Resistor 9 R9 and Resistor 10 R10 respectively; after the said Capacitor 7 C7 and Resistor 12 R12 are connected in series, one end is connected to Pin 2 of optical coupling tube OC, and the other end is connected to one end of Resistor

11 R11 and Resistor 13 R13 and the gate pole g of silicon controlled rectifier V respectively; the other end of Resistor 9 R9 is connected to the other end of Resistor 11 R11 and the positive end of Electrolytic Capacitor 3 E3 respectively, the other end of Resistor 10 R10 is connected to the anode a of silicon controlled  
 5 rectifier V, and the cathode k of silicon controlled rectifier V, the other end of Resistor 13 R13 and the other end of Capacitor 9 C9 all are grounded.

As shown in Fig. 3, in this embodiment, the said display driver 3 comprises the display driver chip IC2, Capacitors 10-13 C10-C13, Resistors 14-16 R14-R16 and Electrolytic Capacitor 5 E5; the model of the said display driver  
 10 chip IC2 is SM1635, and it totally has 16 pins; the model of the said LED display 5 is LED-4302, and it totally has 10 pins; after Capacitor 10 C10, Capacitor 11 C11 and Electrolytic Capacitor 5 E5 are connected in parallel, one end is connected to +5V DC voltage (i.e. the positive end of Electrolytic Capacitor 3 E3) outputted by DC stabilized power supply 1, Pin 13 of display  
 15 driver chip IC2 and one end of Resistor 16 R16 respectively, and the other end is grounded, and Capacitor 10 C10, Capacitor 11 C11 and Electrolytic Capacitor 5 C5 constitute a filter anti-jamming circuit; the other end of the said Resistor 16 R16 is connected to one end of Resistor 15 R15 and Pin 14 of display driver chip IC2 respectively; one end of the said Resistor 14 R14 is connected to Pin 15 of  
 20 display driver chip IC2, and the other end of Resistor 14 R14 and Resistor 15 R15 are connected to central processing unit 6 through the connector CN1 respectively; Pin 16 of display driver chip IC2 is connected to the output end of key input unit 4, Pins 2-10 of display driver chip IC2 are connected to Pin 4, Pin 3, Pin 1, Pin 9, Pin 8, Pin 7, Pin 6, Pin 5, Pin 2 and Pin 10 of LED display 5  
 25 respectively, and the LED display 5 displays the signals inputted by display driver chip IC2.

As shown in Fig. 3, in this embodiment, the said key input unit 4 comprises the key chip IC3, reset key SW0, Key 1 SW1, Key 2 SW2, Resistors 18-24 R18-R24, Capacitors 14-17 C14-C17, and Triodes 2-4 Q2-Q4; wherein, the

model of the said key chip IC3 is WTC6104ASI, and it totally has 16 pins; the output end of the said reset key SW0 is connected to Pin 6 of key chip IC3 through Resistor 20 R20, the output end of the said Key 1 SW1 is connected to Pin 5 of key chip IC3 through Resistor 19 R19, and the output end of Key 2 SW2 is connected to Pin 4 of key chip IC3 through Resistor 18 R18; after the said Capacitor 14 C14 is connected to Capacitor 15 C15 in parallel, one end is connected to Pin 7 of key chip IC3, and the other end is grounded, and Pin 8 of key chip IC3 is also grounded; one end of the said Capacitor 16 C16 is connected to Pin 11 of key chip IC3 and one end of Resistor 24 R24 respectively, and the other end of Capacitor 16 C16 is grounded; one end of Capacitor 17 C17 is connected to the other end of Resistor 24 R24, Pin 1 of key chip IC3, Pin 12 of key chip IC3 and +5V DC voltage (i.e. the positive end of Electrolytic Capacitor 3 E3) outputted by DC stabilized power supply 1 respectively, and the other end of Capacitor 17 C17 is grounded; Pin 13 of key chip IC3 is connected to the base electrode of Triode 2 Q2 through Resistor 21 R21, the emitter electrode of Triode 2 Q2 is connected to Pin 6 of display driver chip IC2, and the collector electrode of Triode 2 Q2 is connected to Pin 16 of display driver chip IC2; Pin 10 of key chip IC3 is connected to the base electrode of Triode 3 Q3 through Resistor 22 R22, the emitter electrode of Triode 3 Q3 is connected to Pin 7 of display driver chip IC2, and the collector electrode of Triode 3 Q3 is connected to Pin 16 of display driver chip IC2; Pin 9 of key chip IC3 is connected to the base electrode of Triode 4 Q4 through Resistor 23 R23, the emitter electrode of Triode 4 Q4 is connected to Pin 8 of display driver chip IC2, and the collector electrode of Triode 4 Q4 is connected to Pin 16 of display driver chip IC2.

As shown in Fig. 3, in this embodiment, the said alarm 7 comprises Triode 1 Q1, Diode 8 D8, Resistor 17 R17 and loudspeaker YZ; wherein, one end of Resistor 17 R17 is connected to the base electrode of Triode 1 Q1, the emitter electrode of Triode 1 Q1 is grounded, the collector electrode of Triode 1 Q1 is connected to the positive end of Diode 8 D8, the negative end of Diode 8 D8 is

connected to +5V DC voltage (i.e. the positive end of Electrolytic Capacitor 3 E3) outputted by DC stabilized power supply 1, and the said loudspeaker YZ is connected to both ends of Diode 8 D8 in parallel.

As shown in Fig. 4, in this embodiment, the said central processing unit 6 comprises the master chip MCU, crystal Y, Resistors 25-33 R25-R33, Capacitors 18-20 C18-C20 and Electrolytic Capacitor 6 E6; wherein, the model of the said master chip MCU is 2501B, and it totally has 14 pins; one end of the said Resistor 25 R25 is connected to Pin 2 of the master pin MCU, and the other end is connected to the other end of Resistor 14 R14; one end of the said Resistor 26 R26 is connected to Pin 1 of the master pin MCU, and the other end is connected to the other end of Resistor 17 R17 (i.e. the input end of the alarm 7); one end of the said Resistor 27 R27 is connected to Pin 3 of the master pin MCU, and the other end is connected to the other end of Resistor 15 R15 through the connector CN1; the said Resistor 33 R33, Electrolytic Capacitor 6 E6 and Capacitor 18 C18 are connected in parallel between Pin 4 and Pin 11 of the master pin MCU, Pin 4 of the master pin MCU is also connected to +5V DC voltage (i.e. the positive end of Electrolytic Capacitor 3 E3) outputted by DC stabilized power supply 1, and Pin 11 of the master pin MCU is grounded; one end of the said Resistor 28 R28 is connected to Pin 14 of the master pin MCU, one end of the said Resistor 29 R29 is connected to Pin 13 of the master pin MCU, one end of the said Resistor 30 R30 is connected to Pin 12 of the master pin MCU, one end of the said Resistor 31 R31 is connected to Pin 10 of the master pin MCU, one end of the said Resistor 32 R32 is connected to Pin 9 of the master pin MCU, and the other end of Resistor 28 R28, Resistor 29 R29, Resistor 30 R30, Resistor 31 R31, and Resistor 32 R32 all are connected to the input end of their respective execution circuit 8; one end of the said crystal Y is connected to one end of Capacitor 19 C19 and Pin 6 of the master chip MCU respectively, the other end of the crystal Y is connected to one end of Capacitor 20 C20 and Pin 5 of the master pin MCU, and the other end of Capacitor 19 C19 and the other end of

Capacitor 20 C20 both are grounded.

As shown in Fig. 4, in this embodiment, the said execution circuit 8 comprises the driver chip IC4 and Relays 1-5 J1-J5; wherein, the model of the said driver chip IC4 is ULN2004, and it totally has 16 pins, Pin 1, Pin 2, Pin 3, Pin 4 and Pin 5 of the driver chip IC4 are connected to the other end of Resistor 28 R28, Resistor 29 R29, Resistor 30 R30, Resistor 31 R31, and Resistor 32 R32, and Pin 8 of the driver chip IC4 is grounded; Pin 16 of the driver chip IC4 is connected to one end of Relay 1 J1, the other end of Relay 1 J1 is connected to +5V DC voltage outputted by DC stabilized power supply 1, the normally open and normally closed common contact of Relay 1 J1 is connected to one input end of Thermocouple 1 V1, and the other normally open contact of Relay 1 J1 is connected to one end of Solenoid Valve 1 SYM1, and Thermocouple 1 V1, is connected to Solenoid Valve 1 SYM1 in series; Pin 15 of the driver chip IC4 is connected to one end of Relay 2 J2, the other end of Relay 2 J2 is connected to +5V DC voltage outputted by DC stabilized power supply 1, the normally open and normally closed common contact of Relay 2 J2 is connected to one input end of Thermocouple 2 V2, and the other normally open contact of Relay 2 J2 is connected to one end of Solenoid Valve 2 SYM2, and Thermocouple 2 V2, is connected to Solenoid Valve 2 SYM2 in series; Pin 14 of the driver chip IC4 is connected to one end of Relay 3 J3, the other end of Relay 3 J3 is connected to +5V DC voltage outputted by DC stabilized power supply 1, the normally open and normally closed common contact of Relay 3 J3 is connected to one input end of Thermocouple 3 V3, and the other normally open contact of Relay 3 J3 is connected to one end of Solenoid Valve 3 SYM3, and Thermocouple 3 V3, is connected to Solenoid Valve 3 SYM3 in series; Pin 13 of the driver chip IC4 is connected to one end of Relay 4 J4, the other end of Relay 4 J4 is connected to +5V DC voltage outputted by DC stabilized power supply 1, the normally open and normally closed common contact of Relay 4 J4 is connected to one input end of Thermocouple 4 V4, and the other normally open contact of Relay 4 J4 is

connected to one end of Solenoid Valve 4 SYM4, and Thermocouple 4 V4, is connected to Solenoid Valve 4 SYM4 in series; Pin 12 of the driver chip IC4 is connected to one end of Relay 5 J5, the other end of Relay 5 J5 is connected to +5V DC voltage outputted by DC stabilized power supply 1, the normally open and normally closed common contact of Relay 5 J5 is connected to one input end of Thermocouple 5 V5, and the other normally open contact of Relay 5 J5 is connected to one end of Solenoid Valve 5 SYM5, and Thermocouple 5 V5, is connected to Solenoid Valve 5 SYM5 in series. The number of relays is the same as the number of stoves.

The above describes the specific embodiments of the utility model in detail in conjunction with the accompanying figures. It needs to be noted here that, the utility model is not limited to the described embodiments. For persons of ordinary skill in the art, changes, modification, replacements and deformation to these embodiments under the condition of not separating from the principle and purpose of the utility model still fall within the protection scope of the utility model.

## Claims

1. A gas valve timing shut-off device for gas stove, characterized in that it comprises:

5 DC stabilized power supply (1) and voltage feedback circuit (2); the said voltage feedback circuit (2) receives the DC voltage change value outputted by DC stabilized power supply (1), and after having the DC voltage change value outputted by DC stabilized power supply (1) processed, outputs it to DC stabilized power supply (1) so as to stabilize the output DC voltage of DC  
10 stabilized power supply (1); and the DC voltage outputted by DC stabilized power supply (1) provides DC working voltage to the following devices; and

Display driver (3), key input unit (4), LED display (5), central processing unit (6), alarm (7), and execution circuit (8); wherein, the said display driver (3) receives the time signals inputted by key input unit (4), and after having the  
15 signals processed, outputs them to LED display (5) and central processing unit (6), the said central processing unit (6), after having the signals inputted by display driver (3) processed, inputs the signals to execution circuit (8), the said execution circuit (8), after having the signals inputted by central processing unit (6) processed, controls the solenoid valves of gas stove, and the display driver (3)  
20 also receives the signals inputted by central processing unit (6), and after having the signals processed, outputs them to LED display (5) to be displayed.

2. The gas valve timing shut-off device for gas stove according to Claim 1, is characterized in that the said display driver (3) comprises the display driver chip (IC2), Capacitors 10-13 (C10-C13), Resistors 14-16 (R14-R16) and  
25 Electrolytic Capacitor 5 (E5); the model of the said display driver chip (IC2) is SM1635, and it totally has 16 pins; the model of the said LED display (5) is LED-4302, and it totally has 10 pins; after Capacitor 10 (C10), Capacitor 11 (C11) and Electrolytic Capacitor 5 (E5) are connected in parallel, one end is connected to +5V DC voltage outputted by DC stabilized power supply (1), Pin

13 of display driver chip (IC2) and one end of Resistor 16 (R16) respectively, and the other end is grounded; the other end of the said Resistor 16 (R16) is connected to one end of Resistor 15 (R15) and Pin 14 of display driver chip (IC2); one end of the said Resistor 14 (R14) is connected to Pin 15 of display driver chip (IC2), and the other end of Resistor 14 (R14) and Resistor 15 (R15) are connected to central processing unit (6) respectively; Pin 16 of display driver chip (IC2) is connected to the output end of key input unit (4), Pins 2-10 of display driver chip (IC2) are connected to Pin 4, Pin 3, Pin 1, Pin 9, Pin 8, Pin 7, Pin 6, Pin 5, Pin 2 and Pin 10 of LED display (5) respectively.

3. The gas valve timing shut-off device for gas stove according to Claim 2, is characterized in that the said key input unit (4) comprises the key chip (IC3), reset key (SW0), Key 1 (SW1), Key 2 (SW2), Resistors 18-24 (R18-R24), Capacitors 14-17 (C14-C17), and Triodes 2-4 (Q2-Q4); wherein, the model of the said key chip (IC3) is WTC6104ASI, and it totally has 16 pins; the output end of the said reset key (SW0) is connected to Pin 6 of key chip (IC3) through Resistor 20 (R20), the output end of the said Key 1 (SW1) is connected to Pin 5 of key chip (IC3) through Resistor 19 (R19), and the output end of Key 2 (SW2) is connected to Pin 4 of key chip (IC3) through Resistor 18 (R18); after the said Capacitor 14 (C14) and Capacitor 15 (C15) are connected in parallel, one end is connected to Pin 7 of key chip (IC3), and the other end is grounded, and Pin 8 of key chip (IC3) is also grounded; one end of the said Capacitor 16 (C16) is connected to Pin 11 of key chip (IC3) and one end of Resistor 24 (R24) respectively, and the other end of Capacitor 16 (C16) is grounded; one end of Capacitor 17 (C17) is connected to the other end of Resistor 24 (R24), Pin 1 of key chip (IC3), Pin 12 of key chip (IC3) and +5V DC voltage outputted by DC stabilized power supply (1) respectively, and the other end of Capacitor 17 (C17) is grounded; Pin 13 of key chip (IC3) is connected to the base electrode of Triode 2 (Q2) through Resistor 21 (R21), the emitter electrode of Triode 2 (Q2) is connected to Pin 6 of display driver chip (IC2), and the collector electrode of

Triode 2 (Q2) is connected to Pin 16 of display driver chip (IC2); Pin 10 of key chip (IC3) is connected to the base electrode of Triode 3 (Q3) through Resistor 22 (R22), the emitter electrode of Triode 3 (Q3) is connected to Pin 7 of display driver chip (IC2), and the collector electrode of Triode 3 (Q3) is connected to Pin 16 of display driver chip (IC2); Pin 9 of key chip (IC3) is connected to the base electrode of Triode 4 (Q4) through Resistor 23 (R23), the emitter electrode of Triode 4 (Q4) is connected to Pin 8 of display driver chip (IC2), and the collector electrode of Triode 4 (Q4) is connected to Pin 16 of display driver chip (IC2).

4. The gas valve timing shut-off device for gas stove according to Claim 1 or 2, is characterized in that the said central processing unit (6) comprises the master chip (MCU), crystal (Y), Resistors 25-33 (R25-R33), Capacitors 18-20 (C18-C20) and Electrolytic Capacitor 6 (E6); wherein, the model of the said master chip (MCU) is 2501B, and it totally has 14 pins; one end of the said Resistor 25 (R25) is connected to Pin 2 of the master pin (MCU), and the other end is connected to the other end of Resistor 14 (R14); one end of the said Resistor 26 (R26) is connected to Pin 1 of the master pin (MCU), and the other end is connected to the input end of the alarm (7); one end of the said Resistor 27 (R27) is connected to Pin 3 of the master pin (MCU), and the other end is connected to the other end of Resistor 15 (R15); the said Resistor 33 (R33), Electrolytic Capacitor 6 (E6) and Capacitor 18 (C18) are connected in parallel between Pin 4 and Pin 11 of the master pin (MCU), Pin 4 of the master pin (MCU) is also connected to +5V DC voltage outputted by DC stabilized power supply (1), and Pin 11 of the master pin (MCU) is grounded; one end of the said Resistor 28 (R28) is connected to Pin 14 of the master pin (MCU), one end of the said Resistor 29 (R29) is connected to Pin 13 of the master pin (MCU), one end of the said Resistor 30 (R30) is connected to Pin 12 of the master pin (MCU), one end of the said Resistor 31 (R31) is connected to Pin 10 of the master pin (MCU), one end of the said Resistor 32 (R32) is connected to Pin 9 of the master pin (MCU), and the other end of Resistor 28 (R28), Resistor 29 (R29), Resistor

30 (R30), Resistor 31 (R31), and Resistor 32 (R32) all are connected to the input end of their respective execution circuit (8); one end of the said crystal (Y) is connected to one end of Capacitor 19 (C19) and Pin 6 of the master chip (MCU) respectively, the other end of the crystal (Y) is connected to one end of Capacitor 20 (C20) and Pin 5 of the master pin (MCU), and the other end of Capacitor 19 (C19) and the other end of Capacitor 20 (C20) both are grounded.

5. The gas valve timing shut-off device for gas stove according to Claim 1, is characterized in that the said execution circuit (8) comprises the driver chip (IC4) and Relays 1-5 (J1-J5); wherein, the model of the said driver chip (IC4) is ULN2004, and it totally has 16 pins, Pin 1, Pin 2, Pin 3, Pin 4 and Pin 5 of the driver chip (IC4) are connected to the other end of Resistor 28 (R28), Resistor 29 (R29), Resistor 30 (R30), Resistor 31 (R31), and Resistor 32 (R32), and Pin 8 of the driver chip (IC4) is grounded; Pin 16 of the driver chip (IC4) is connected to one end of Relay 1 (J1), the other end of Relay 1 (J1) is connected to +5V DC voltage outputted by DC stabilized power supply (1), the normally open and normally closed common contact of Relay 1 (J1) is connected to one input end of Thermocouple 1 (V1), and the other normally open contact of Relay 1 (J1) is connected to one end of Solenoid Valve 1 (SYM1); Pin 15 of the driver chip (IC4) is connected to one end of Relay 2 (J2), the other end of Relay 2 (J2) is connected to +5V DC voltage outputted by DC stabilized power supply (1), the normally open and normally closed common contact of Relay 2 (J2) is connected to one input end of Thermocouple 2 (V2), and the other normally open contact of Relay 2 (J2) is connected to one end of Solenoid Valve 2 (SYM2); Pin 14 of the driver chip (IC4) is connected to one end of Relay 3 (J3), the other end of Relay 3 (J3) is connected to +5V DC voltage outputted by DC stabilized power supply (1), the normally open and normally closed common contact of Relay 3 (J3) is connected to one input end of Thermocouple 3 (V3), and the other normally open contact of Relay 3 (J3) is connected to one end of Solenoid Valve 3 (SYM3); Pin 13 of the driver chip (IC4) is connected to one end of Relay 4 (J4), the other end

of Relay 4 (J4) is connected to +5V DC voltage outputted by DC stabilized power supply (1), the normally open and normally closed common contact of Relay 4 (J4) is connected to one input end of Thermocouple 4 (V4), and the other normally open contact of Relay 4 (J4) is connected to one end of Solenoid Valve 4 (SYM4); Pin 12 of the driver chip (IC4) is connected to one end of Relay 5 (J5), the other end of Relay 5 (J5) is connected to +5V DC voltage outputted by DC stabilized power supply (1), the normally open and normally closed common contact of Relay 5 (J5) is connected to one input end of Thermocouple 5 (V5), and the other normally open contact of Relay 5 (J5) is connected to one end of Solenoid Valve 5 (SYM5).