

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

10 The gas stove currently used does not have the gas timing shut-off function; 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

15 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 required use time by itself, shut off the breathable valve of gas stove at the set time, and work reliably and safely.

20 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:

25 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; and the DC voltage outputted by DC stabilized power supply provides DC working voltage to the following devices; and

A central processing unit, an alarm, an encoder, LED display, an ignition

signal controller and an execution circuit; wherein, the said encoder inputs the burning time signals required by gas stove into the central processing unit, the said central processing unit, after having the received burning time signals processed, outputs them to the LED display, the ignition signal controller and the execution circuit respectively; the said LED display displays the burning time signals inputted by the central processing unit and feeds back the displayed time signals to the central processing unit; the said ignition signal controller, after receiving the burning time signals inputted by the central processing unit, controls the igniter work of gas stove; the central processing unit, after having the received burning time signals processed, outputs them to the solenoid valve of gas stove to have the solenoid valve of gas stove opened; and the said execution circuit, after having the signals inputted by the central processing unit processed, controls the solenoid valve work of gas stove.

The said central processing unit comprises the master chip, the model of which is TM57PA40 and it totally has twenty pins; Pin 13 of the master chip is electrically connected to the input end of the alarm, Pin 9 and 10 of the master chip are electrically connected to the output ends of the encoder respectively, Pin 11 of the master chip is electrically connected to the linked switch of one solenoid valve of gas stove through Resistor 23, Pin 12 of the master chip is electrically connected to the linked switch of another solenoid valve of gas stove through Resistor 24, Pin 15 of the master chip is electrically connected to the linked switch of yet another solenoid valve of gas stove through Resistor 25, Pin 16 of the master chip is electrically connected to the linked switch of still another solenoid valve of gas stove through Resistor 26, Pin 2 and 3 of the master chip are electrically connected to the input ends of the ignition signal controller respectively, Pin 7 and 8 of the master chip are electrically connected to the input ends of the execution circuit, Pins 14, 18, 19, 5, 6, 11, 12, 15, 16, and 17 of the master chip are electrically connected to the input and output ends of LED display, Pin 20 of the master chip is connected to +4.5V DC voltage outputted by

DC stabilized power supply, and Pin 1 of the master chip is connected to the output ground of DC stabilized power supply, and Pin 4 of the master chip is connected to one end of Resistor 14 and Capacitor 11 respectively.

The said encoder comprises the key encoder and resistors 19-22, wherein,
 5 the model of the said key encoder is EC111002T2D-HA1-002; one end of the said Resistor 19 is electrically connected to Pin 9 of the master chip, and the other end is electrically connected to one end of Resistor 22 and one output pin of the key encoder respectively, and the other end of Resistor 22 is connected to +4.5V DC voltage outputted by DC stabilized power supply; one end of the said
 10 Resistor 20 is electrically connected to Pin 10 of the master chip, and the other end is electrically connected to one end of Resistor 21 and the other output pin of the key encoder respectively, and the other end of Resistor 21 is connected to +4.5V DC voltage outputted by DC stabilized power supply.

The said LED display comprises the display panel, resistors 27-32 and
 15 triodes 2-4; the model of the said display panel is ULF-5361, and it totally has 12 pins; wherein, one end of the said Resistor 27 is electrically connected to Pin 19 of the master chip, and the other end is electrically connected to one end of Resistor 32 and the base electrode of Triode 4 respectively, the other end of the said Resistor 32 and the emitter electrode of Triode 4 both are grounded, and the
 20 collector electrode of the said Triode 4 is electrically connected to Pin 9 of the display panel; one end of the said Resistor 28 is electrically connected to Pin 18 of the master chip, and the other end is electrically connected to one end of Resistor 31 and the base electrode of Triode 3, the other end of the said Resistor 31 and the emitter electrode of Triode 3 both are grounded, and the collector
 25 electrode of the said Triode 3 is electrically connected to Pin 8 of the display panel; one end of the said Resistor 29 is electrically connected to Pin 14 of the master chip, and the other end is electrically connected to one end of Resistor 30 and the base electrode of Triode 2 respectively, the other end of the said Resistor 30 and the emitter electrode of Triode 2 both are grounded, and the collector

electrode of the said Triode 2 is electrically connected to Pin 12 of the display panel.

The said ignition signal controller comprises Triode 5, Capacitor 12, Electrolytic Capacitor 7 and resistors 39-43; wherein, one end of the said
 5 Resistor 39 is electrically connected to Pin 2 of the master chip through Resistor 36, and the other end is electrically connected to the igniter; one end of Resistor 40 is electrically connected to Pin 3 of the master chip and one end of Resistor 41 through Resistor 35, and the other end of Resistor 40 is electrically connected to another igniter; the other end of the said Resistor 41 is electrically connected
 10 to the base electrode of Triode 5 and one end of Resistor 42 respectively, the other end of Resistor 42 is electrically connected to the emitter electrode of Triode 5 and one end of Resistor 43 respectively, the emitter electrode of Triode 5 is connected to +2.7V DC voltage outputted by DC stabilized power supply, the other end of Resistor 43 is electrically connected to one end of Capacitor 12,
 15 the positive end of Electrolytic Capacitor 7 and the collector electrode of Triode 5 respectively, and the base electrode of Triode 5 provides working voltage to the igniter.

The said execution circuit comprises the driver chip, Relays 1- 6, Resistors 44-53, Diodes 12-15, Inductive Coils 2-5, Electrolytic Capacitor 8 and
 20 Electrolytic Capacitor 9; wherein, the model of the said driver chip is ULN2001 and it totally has eight pins, Pin 1 of the driver chip is electrically connected to Pin 8 of the master chip through Resistor 37 and Resistor 33, Pin 2 of the driver chip is electrically connected to Pin 7 of the master chip through Resistor 38 and Resistor 34, Pin 7 of the driver chip is electrically connected to one end of Relay
 25 3 and Relay 6 respectively, the other end of Relay 3 and Relay 6 both are connected to +4.5V DC voltage outputted by DC stabilized power supply, Pin 8 of the driver chip is electrically connected to one end of Relay 1, Relay 2, Relay 4, and Relay 5 respectively, and the other end of Relay 1, Relay 2, Relay 4, and Relay 5 are connected to +4.5V DC voltage outputted by stabilized power supply;

the normally open contact of Relay 1 is electrically connected to one end of Resistor 44, and its control end is electrically connected to one end of Inductive Coil 2 and the negative electrode of Diode 12 respectively, the other end of Resistor 44 is connected to +4.5V DC voltage outputted by DC stabilized power supply, the other end of Inductive Coil 2 is grounded, and Inductive Coil 2 is wound onto the solenoid valve controlled by it; the normally open contact of Relay 2 is electrically connected to one end of Resistor 45, and its control end is electrically connected to one end of Inductive Coil 3 and the negative electrode of Diode 13 respectively, the other end of Resistor 45 is connected to +4.5V DC voltage outputted by DC stabilized power supply, the other end of Inductive Coil 3 is grounded, and Inductive Coil 3 is wound onto the solenoid valve controlled by it; the normally open contact of Relay 3 is electrically connected to one end of Resistor 46, its control end is electrically connected to the positive end of Electrolytic Capacitor 8, and its normally closed contact is electrically connected to one end of Resistor 47 and Resistor 48 respectively, the negative end of Electrolytic Capacitor 8 is grounded, the other end of Resistor 47 is electrically connected to the positive electrode of Diode 13, and the other end of Resistor 48 is electrically connected to the positive electrode of Diode 12; the normally open contact of Relay 4 is electrically connected to one end of Resistor 49, its control end is electrically connected to one end of Inductive Coil 4 and the negative electrode of Diode 14 respectively, the other end of Resistor 49 is connected to +4.5V DC voltage outputted by DC stabilized power supply, the other end of Inductive Coil 4 is grounded, and Inductive Coil 4 is wound onto the solenoid valve controlled by it; the normally open contact of Relay 5 is electrically connected to one end of Resistor 50, its control end is electrically connected to one end of Inductive Coil 5 and the negative electrode of Diode 15 respectively, the other end of Resistor 50 is connected to +4.5V DC voltage outputted by DC stabilized power supply, the other end of Inductive Coil 5 is grounded, and Inductive Coil 5 is wound onto the solenoid valve controlled by it; the normally

open contact of Relay 6 is electrically connected to one end of Resistor 51, its control end is electrically connected to the positive end of Electrolytic Capacitor 9, and its normally closed contact is electrically connected to one end of Resistor 52 and Resistor 53 respectively, the negative end of Electrolytic Capacitor 9 is grounded, the other end of Resistor 52 is electrically connected to the positive electrode of Diode 15, and the other end of Resistor 53 is electrically connected to the positive electrode of Diode 14.

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 central processing unit, encoder, LED display and alarm;

Fig. 4 is a schematic circuit diagram for the utility model's ignition signal controller and execution circuit.

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. 55" 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,

comprising:

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
 5 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 provides DC working voltage to the following devices; and

Central processing unit 3, alarm 4, encoder 5, LED display 6, ignition signal
 10 controller 7 and execution circuit 8; wherein, the said encoder 5 inputs the burning time signals required by gas stove into central processing unit 3, the said central processing unit 3, after having the received burning time signals processed, outputs them to LED display 6, ignition signal controller 7 and execution circuit 8 respectively; the said LED display 6 displays the burning
 15 time signals inputted by central processing unit 3 and feeds back the displayed time signals to central processing unit 3; the said ignition signal controller 7, after receiving the burning time signals inputted by central processing unit 3, controls the igniter work of gas stove; the central processing unit 3, after having the received burning time signals processed, outputs them to the solenoid valve
 20 of gas stove to have the solenoid valve of gas stove opened; and the said execution circuit 8, after having the signals inputted by central processing unit 3 processed, controls the solenoid valve work of gas stove.

In working, input the required time signals to the central processing unit 3 through the encoder 5, LED display 6 displays the time signals inputted by the
 25 encoder 5, the central processing unit 3 inputs the signals into the ignition signal controller 7 and the solenoid valves, to have the solenoid valve of gas stove opened, and the ignition signal controller 7 ignites such stove to work, and the execution circuit 8 does not work; when it is time to close, the central processing unit 3 will input the shut-off signals into the execution circuit 8, and the

execution circuit 8 will work to shut off the solenoid valves, 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, piezoresistor ZNR, electromagnetic interference coil EMI, Resistors 1-5 R1-R5, Diodes 1-6 D1-D6, thermistor NTC, Electrolytic Capacitors 1-3 E1-E3, Capacitors 1-5 C1-C5, inductor L and transformer F; 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 the other end of Resistor 1 R1, the other end of Capacitor 1 C1, the other end of electromagnetic interference coil EMI and zero line of the AC mains respectively; 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 thermistor 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; one end of Resistor 2 R2, Resistor 3 R3 and Capacitor 2 C2 are connected to the other end of adjustable thermistor NTC, the positive end of Electrolytic Capacitor 1 E1 and Pin 1 of primary coil of Transformer T respectively, the other end of Resistor 3 R3 and Capacitor 2 C2 are connected to the negative end of Diode 5 D5 respectively, and the positive end of Diode 5 D5 is connected to Pin 3 of primary coil of Transformer T; after the said Capacitor 3 C3 is connected to Resistor 4 R4 in series, its one end is connected to Pin 7 of secondary coil of Transformer T and the positive end of Diode 6 D6, and the other end is connected to the negative end of Diode 6 D6, the positive end of Electrolytic Capacitor 2 E2, one end of Capacitor 4 C4, one end of Resistor 5 R5, and one end of Inductor L respectively, and Pin 6 of secondary coil of Transformer T, the negative end of

Electrolytic Capacitor 2 E2, the other end of Capacitor 4 C4 and the other end of Resistor 5 R5 all are grounded; 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, the other end of Inductor L is the output end of 4.5V voltage of DC
 5 stabilized power supply, and the negative end of Electrolytic Capacitor 3 E3 and the other end of Capacitor 5 C5 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 7-11 D7-D11, the optical coupling tube OC, Electrolytic Capacitor 4 E4, Resistors 6-13 R6-R13,
 10 and Capacitors 6-8 C6-C8; wherein, the model of the said off-line switch IC1 is OB2338AP, and it totally has eight pins; one end of the said Resistor 6 R6 is electrically connected to the other end of Resistor 2 R2, one end of Resistor 7 R7 and the positive end of Electrolytic Capacitor 4 E4 respectively, the other end of Resistor 6 R6 is electrically connected to the negative end of Diode 7 D7, the
 15 positive end of Diode 7 D7 is connected to Pin 4 of primary coil of Transformer T, and Pin 5 of primary coil of Transformer T is connected to the ground and Pin 8 of off-line switch IC1 respectively; the negative end of Electrolytic Capacitor 4 E4, one end of Capacitor 6 C6, one end of Resistor 8 R8, the positive end of Diode 8 D8, one end of Capacitor 7 C7 and Pin 3 of optical coupling tube OC all
 20 are grounded, the other end of Resistor 7 R7 and the other end of Capacitor 6 C6 are electrically connected to Pin 2 and 3 of off-line switch IC1 respectively, and the other end of Resistor 8 R8 is electrically connected to Pin 4 of off-line switch IC1; the negative end of Diode 8 D8 is connected to Pin 1 of off-line switch IC1, the other end of Capacitor 7 C7 and Pin 4 of optical coupling tube OC
 25 respectively, Pin 5 and 6 of off-line IC1 are connected to Pin 3 of primary coil of transformer T; 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 8 C8 is connected to Resistor 11 R11 in series, its one end is connected to Pin 2 of optical coupling tube OC, and the other end is connected to one end of Resistor

12 R12 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 12 R12 and the positive end of Diode 9 D9 respectively, the other end of Resistor 10 R10 is connected to the anode a of silicon controlled rectifier V, and
 5 the cathode k of silicon controlled rectifier V and the other end of Resistor 13 R13 both are grounded respectively; after Diode 10 D10 is connected to Diode 11 D11 in series, the positive end of Diode 10 D10 is electrically connected to the negative end of Diode 9 D9, and the negative end of Diode 11 D11 outputs 2.7V DC voltage to be used by electrical fire.

10 As shown in Fig. 3, in this embodiment, the said central processing unit 3 comprises the master chip MCU, the model of which is TM57PA40, and it totally has twenty pins; Pin 4 of the master chip MCU is electrically connected to the input end of alarm 4, Pin 9 and 10 of the master chip MCU are electrically connected to the output ends of encoder 5 respectively, Pin 11 of the master chip
 15 MCU is electrically connected to the linked switch of one solenoid valve of gas stove through Resistor 23 R23, Pin 12 of the master chip MCU is electrically connected to the linked switch of another solenoid valve of gas stove through Resistor 24 R24, Pin 15 of the master chip MCU is electrically connected to the linked switch of yet another solenoid valve of gas stove through Resistor 25 R25,
 20 Pin 16 of the master chip MCU is electrically connected to the linked switch of still another solenoid valve of gas stove through Resistor 26 R26, and in working, when there is input of time signals, the master chip MCU will have the solenoid valve of gas stove to be used opened; Pin 2 and 3 of the master chip MCU are electrically connected to the input ends of ignition signal controller 7
 25 respectively, and in working, when there is input of time signals, the master chip MCU will have the igniter of gas stove to be used opened; Pin 7 and 8 of the master chip MCU are electrically connected to the input ends of execution circuit 8, and in working, when the required heating time is over, the master chip MCU will input the stop signals into the execution circuit 8, and the execution circuit 8

will have the opened solenoid valve closed; Pins 14, 18, 19, 5, 6, 11, 12, 15, 16, and 17 of the master chip MCU are electrically connected to the input and output ends of LED display 6, Pin 20 of the master chip MCU is connected to +4.5V DC voltage outputted by DC stabilized power supply 1, and Pin 1 of the master chip MCU is connected to the output ground of DC stabilized power supply 1. Pin 4 of the master chip MCU is connected to one end of Resistor 14 and Capacitor 11 respectively.

As shown in Fig.3, in this embodiment, the said encoder 5 comprises the key encoder PG and resistors 19-22 R19-R22; the model of the said key encoder PG is EC111002T2D-HA1-002; one end of the said Resistor 19 R19 is electrically connected to Pin 9 of the master chip MCU, and the other end is electrically connected to one end of Resistor 22 R22 and one output pin of the key encoder PG respectively, and the other end of Resistor 22 R22 is connected to +4.5V DC voltage outputted by DC stabilized power supply 1; one end of the said Resistor 20 R20 is electrically connected to Pin 10 of the master chip MCU, and the other end is electrically connected to one end of Resistor 21 R21 and the other output pin of key encoder PG respectively, and the other end of Resistor 21 R21 is connected to +4.5V DC voltage outputted by DC stabilized power supply 1. In working, the required time is inputted into Pin 9 and Pin 10 of the master chip MCU through the key encoder PG.

As shown in Fig. 3, in this embodiment, the said LED display 6 comprises the display panel LED, resistors 27-32 R27-R32 and triodes 2-4 Q2-Q4; wherein, the model of the said display panel LED is ULF-5361, and it totally has 12 pins; one end of the said Resistor 27 R27 is electrically connected to Pin 19 of the master chip MCU, and the other end is electrically connected to one end of Resistor 32 R32 and the base electrode of Triode 4 Q4 respectively, the other end of the said Resistor 32 R32 and the emitter electrode of Triode Q4 both are grounded, and the collector electrode of the said Triode 4 Q4 is electrically connected to Pin 9 of the display panel LED; one end of the said Resistor 28 R28

is electrically connected to Pin 18 of the master chip MCU, and the other end is electrically connected to one end of Resistor 31 R31 and the base electrode of Triode 3 Q3, the other end of the said Resistor 31 R31 and the emitter electrode of Triode 3 Q3 both are grounded, and the collector electrode of the said Triode 3 Q3 is electrically connected to Pin 8 of the display panel LED; one end of the said Resistor 29 R29 is electrically connected to Pin 14 of the master chip MCU, and the other end is electrically connected to one end of Resistor 30 R30 and the base electrode of Triode 2 Q2 respectively, the other end of the said Resistor 30 R30 and the emitter electrode of Triode 2 Q2 both are grounded, and the collector electrode of the said Triode 2 Q2 is electrically connected to Pin 12 of the display panel LED. In working, the display panel LED displays the time signals inputted by the master chip MCU.

As shown in Fig. 3, in this embodiment, the said alarm 4 comprises the Triode 1 Q1, Resistors 4-18 R14—R18 and loudspeaker YZ; wherein, one end of Resistor 17 R17 is connected to the base electrode of Triode 1 Q1 and one end of Resistor 18 R18 respectively, the collector electrode of Triode 1 Q1 and the other end of Resistor 17 R17 both are grounded, the emitter electrode of Triode 1 Q1 is electrically connected to one end of Resistor 16 R16, the other end of Resistor 16 R16 is connected to +4.5V DC voltage (i.e. the positive end of Electrolytic Capacitor 3 E3) outputted by DC stabilized power supply 1 through Resistor 15 R15, and the other end of Resistor 18 R18 is electrically connected to Pin 13 of the master chip MCU; one end of the said Resistor 14 R14 is connected to +4.5V DC voltage outputted by DC stabilized power supply 1, and the other end is connected to Pin 4 of the master chip MCU; and the said loudspeaker YZ is connected to both ends of Resistor R16 in parallel.

As shown in Fig. 4, in this embodiment, the said ignition signal controller 7 comprises Triode 5 Q5, Capacitor 12 C12, Electrolytic Capacitor 7 E7 and Resistors 39-43 R39-R43; wherein, one end of the said Resistor 39 R39 is electrically connected to Pin 2 of the master chip MCU, and the other end is

electrically connected to the igniter; one end of the said Resistor 40 R40 is electrically connected to Pin 3 of the master chip MCU and one end of Resistor 41 R41, and the other end of Resistor 40 R40 is electrically connected to another igniter; the other end of the said Resistor 41 R41 is electrically connected to the
 5 base electrode of Triode 5 Q5 and one end of Resistor 42 R42 respectively, the other end of Resistor 42 R42 is electrically connected to the emitter electrode of Triode 5 Q5 and one end of Resistor 43 R43 respectively, the emitter electrode of Triode 5 Q5 is connected to +2.7V DC voltage outputted by DC stabilized power supply 1, the other end of Resistor 43 R43 is electrically connected to one
 10 end of Capacitor 12 C12, the positive end of Electrolytic Capacitor 7 E7 and the collector electrode of Triode 5 Q5 respectively, and the base electrode of Triode 5 Q5 provides working voltage to the igniter.

As shown in Fig. 4, in this embodiment, the said execution circuit 8 comprises the driver chip IC2, Relays 1-6 J1-J6, Resistors 44-53 R44-R53,
 15 Diodes 12-15 D12-D15, Inductive Coils 2-5 L2-L5, Electrolytic Capacitor 8 E8 and Electrolytic Capacitor 9 E9; wherein, the model of the said driver chip IC2 is ULN2001 and it totally has eight pins; Pin 1 of the driver chip IC2 is electrically connected to Pin 8 of the master chip MCU through Resistor 37 R37 and Resistor 33 R33, Pin 2 of the driver chip IC2 is electrically connected to Pin 7 of
 20 the master chip MCU through Resistor 38 R38 and Resistor 34 R34, Pin 7 of the driver chip IC2 is electrically connected to one end of Relay 3 J3 and Relay 6 J6 respectively, the other end of Relay 3 J3 and Relay 6 J6 both are connected to +4.5V DC voltage outputted by DC stabilized power supply 1, Pin 8 of the driver chip IC2 is electrically connected to one end of Relay 1 J1, Relay 2 J2, Relay 4
 25 J4, and Relay 5 J5 respectively, and the other end of Relay 1 J1, Relay 2 J2, Relay 4 J4, and Relay 5 J5 are connected to +4.5V DC voltage outputted by stabilized power supply 1.

As shown in Fig. 4, in this embodiment, the normally open contact of Relay 1 J1 is electrically connected to one end of Resistor 44 R44, and its control end is

electrically connected to one end of Inductive Coil 2 L2 and the negative electrode of Diode 12 D12 respectively, the other end of Resistor 44 R44 is connected to +4.5V DC voltage outputted by DC stabilized power supply 1, the other end of Inductive Coil 2 L2 is grounded, and Inductive Coil 2 L2 is wound
 5 onto the solenoid valve M1 controlled by it. In working, when the driver chip IC2 receives the time end signals outputted by the master chip MCU, Relay 1 J1 will act, its normally open contact will be closed, the Inductive Coil 2 L2 will be energized and generate the electromotive force opposite to the solenoid valve M1 controlled by it, and the solenoid valve M1 will be closed, so as to achieve the
 10 object of shutting off the gas.

As shown in Fig. 4, in this embodiment, the normally open contact of Relay 2 J2 is electrically connected to one end of Resistor 45 R45, and its control end is electrically connected to one end of Inductive Coil 3 L3 and the negative electrode of Diode 13 D13 respectively, the other end of Resistor 45 R45 is
 15 connected to +4.5V DC voltage outputted by DC stabilized power supply 1, the other end of Inductive Coil 3 L3 is grounded, and Inductive Coil 3 L3 is wound onto the solenoid valve M2 controlled by it. In working, when the driver chip IC2 receives the time end signals outputted by the master chip MCU, Relay 2 J2 will act, its normally open contact will be closed, the Inductive Coil 3 L2 will be
 20 energized and generate the electromotive force opposite to the solenoid valve M2 controlled by it, and the solenoid valve M2 will be closed, so as to achieve the object of shutting off the gas.

As shown in Fig. 4, in this embodiment, the normally open contact of Relay 3 J3 is electrically connected to one end of Resistor 46 R46, its control end is
 25 electrically connected to the positive end of Electrolytic Capacitor 8 E8, and its normally closed contact is electrically connected to one end of Resistor 47 R47 and Resistor 48 R48 respectively, the negative end of Electrolytic Capacitor 8 E8 is grounded, the other end of Resistor 47 R47 is electrically connected to the positive electrode of Diode 13 D13, and the other end of Resistor 48 R48 is

electrically connected to the positive electrode of Diode 12 D12. In working, Electrolytic Capacitor 8 E8 plays a role of charging and discharging.

As shown in Fig. 4, in this embodiment, the normally open contact of Relay 4 J4 is electrically connected to one end of Resistor 49 R49, its control end is electrically connected to one end of Inductive Coil 4 L4 and the negative electrode of Diode 14 D14 respectively, the other end of Resistor 49 R49 is connected to +4.5V DC voltage outputted by DC stabilized power supply 1, the other end of Inductive Coil 4 L4 is grounded, and Inductive Coil 4 L4 is wound onto the solenoid valve M3 controlled by it. In working, when the driver chip IC2 receives the time end signals outputted by the master chip MCU, Relay 4 J4 will act, its normally open contact will be closed, the Inductive Coil 4 L4 will be energized and generate the electromotive force opposite to the solenoid valve M3 controlled by it, and the solenoid valve M3 will be closed, so as to achieve the object of shutting off the gas.

As shown in Fig. 4, in this embodiment, the normally open contact of Relay 5 J5 is electrically connected to one end of Resistor 50 R50, its control end is electrically connected to one end of Inductive Coil 5 L5 and the negative electrode of Diode 15 D15 respectively, the other end of Resistor 50 R50 is connected to +4.5V DC voltage outputted by DC stabilized power supply 1, the other end of Inductive Coil 5 L5 is grounded, and Inductive Coil 5 L5 is wound onto the solenoid valve M4 controlled by it. In working, when the driver chip IC2 receives the time end signals outputted by the master chip MCU, Relay 5 J5 will act, its normally open contact will be closed, the Inductive Coil 5 L5 will be energized and generate the electromotive force opposite to the solenoid valve M4 controlled by it, and the solenoid valve M4 will be closed, so as to achieve the object of shutting off the gas.

As shown in Fig. 4, in this embodiment, the normally open contact of Relay 6 J6 is electrically connected to one end of Resistor 51 R51, its control end is electrically connected to the positive end of Electrolytic Capacitor 9 E9, and its

normally closed contact is electrically connected to one end of Resistor 52 R52 and Resistor 53 R53 respectively, the negative end of Electrolytic Capacitor 9 E9 is grounded, the other end of Resistor 52 R52 is electrically connected to the positive electrode of Diode 15 D15, and the other end of Resistor 53 R53 is electrically connected to the positive electrode of Diode 14 D14. In working, Electrolytic Capacitor 9 E9 plays a role of charging and discharging.

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

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

 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
10 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) provides DC working voltage to the following devices; and

 Central processing unit (3), alarm (4), encoder (5), LED display (6),
15 ignition signal controller (7) and execution circuit (8); wherein, the said encoder (5) inputs the burning time signals required by gas stove into central processing unit (3), the said central processing unit (3), after having the received burning time signals processed, outputs them to LED display (6), ignition signal controller (7) and execution circuit (8) respectively; the said LED display (6)
20 displays the burning time signals inputted by central processing unit (3) and feeds back the displayed time signals to central processing unit (3); the said ignition signal controller (7), after receiving the burning time signals inputted by central processing unit (3), controls the igniter work of gas stove; the central processing unit (3), after having the received burning time signals processed,
25 outputs them to the solenoid valve of gas stove to have the solenoid valve of gas stove opened; and the said execution circuit (8), after having the signals inputted by central processing unit (3) processed, controls the solenoid valve work of gas stove.

 2. The gas valve timing shut-off device for gas stove according to Claim 1,

is characterized in that the said central processing unit (3) comprises the master chip (MCU), the model of which is TM57PA40 and it totally has twenty pins; Pin 13 of the master chip (MCU) is electrically connected to the input end of alarm (4), Pin 9 and 10 of the master chip (MCU) are electrically connected to the output ends of encoder (5) respectively, Pin 11 of the master chip (MCU) is electrically connected to the linked switch of one solenoid valve of gas stove through Resistor 23 (R23), Pin 12 of the master chip (MCU) is electrically connected to the linked switch of another solenoid valve of gas stove through Resistor 24 (R24), Pin 15 of the master chip (MCU) is electrically connected to the linked switch of yet another solenoid valve of gas stove through Resistor 25 (R25), Pin 16 of the master chip (MCU) is electrically connected to the linked switch of still another solenoid valve of gas stove through Resistor 26 (R26), Pin 2 and 3 of the master chip (MCU) are electrically connected to the input ends of ignition signal controller (7) respectively, Pin 7 and 8 of the master chip (MCU) are electrically connected to the input ends of execution circuit (8), Pins 14, 18, 19, 5, 6, 11, 12, 15, 16, and 17 of the master chip (MCU) are electrically connected to the input and output ends of LED display (6), Pin 20 of the master chip (MCU) is connected to +4.5V DC voltage outputted by DC stabilized power supply (1), and Pin 1 of the master chip (MCU) is connected to the output ground of DC stabilized power supply (1). Pin 4 of the master chip (MCU) is connected to one end of Resistor 14 and Capacitor 11 respectively, with the other end of Resistor 14 connected to +4.5V DC voltage outputted by DC stabilized power supply (1), and with the other end of Capacitor 11 connected to the ground.

3. The gas valve timing shut-off device for gas stove according to Claim 2, is characterized in that the said encoder (5) comprises the key encoder (PG) and resistors 19-22 (R19-R22); wherein, the model of the said key encoder (PG) is EC111002T2D-HA1-002; one end of the said Resistor 19 (R19) is electrically connected to Pin 9 of the master chip (MCU), and the other end is electrically

connected to one end of Resistor 22 (R22) and one output pin of the key encoder (PG) respectively, and the other end of Resistor 22 (R22) is connected to +4.5V DC voltage outputted by DC stabilized power supply (1); one end of the said Resistor 20 (R20) is electrically connected to Pin 10 of the master chip (MCU),
 5 and the other end is electrically connected to one end of Resistor 21 (R21) and the other output pin of key encoder (PG) respectively, and the other end of Resistor 21 (R21) is connected to +4.5V DC voltage outputted by DC stabilized power supply (1).

4. The gas valve timing shut-off device for gas stove according to Claim 2,
 10 is characterized in that the said LED display (6) comprises the display panel (LED), Resistors 27-32 (R27-R32) and Triodes 2-4 (Q2-Q4); wherein, the model of the said display panel (LED) is ULF-5361, and it totally has 11 pins; one end of the said Resistor 27 (R27) is electrically connected to Pin 19 of the master chip (MCU), and the other end is electrically connected to one end of Resistor 32 (R32) and the base electrode of Triode 4 (Q4) respectively, the other end of the
 15 said Resistor 32 (R32) and the emitter electrode of Triode 4 (Q4) both are grounded, and the collector electrode of the said Triode 4 (Q4) is electrically connected to Pin 9 of the display panel (LED); one end of the said Resistor 28 (R28) is electrically connected to Pin 18 of the master chip (MCU), and the other
 20 end is electrically connected to one end of Resistor 31 (R31) and the base electrode of Triode 3 (Q3), the other end of the said Resistor 31 (R31) and the emitter electrode of Triode 3 (Q3) both are grounded, and the collector electrode of the said Triode 3 (Q3) is electrically connected to Pin 8 of the display panel (LED); one end of the said Resistor 29 (R29) is electrically connected to Pin 14
 25 of the master chip (MCU), and the other end is electrically connected to one end of Resistor 30 (R30) and the base electrode of Triode 2 (Q2) respectively, the other end of the said Resistor 30 (R30) and the emitter electrode of Triode 2 (Q2) both are grounded, and the collector electrode of the said Triode 2 (Q2) is electrically connected to Pin 12 of the display panel (LED).

5. The gas valve timing shut-off device for gas stove according to Claim 2, is characterized in that the said ignition signal controller (7) comprises Triode 5 (Q5), Capacitor 12 (C12), Electrolytic Capacitor 7 (E7) and Resistors 39-43 (R39-R43); wherein, one end of the said Resistor 39 (R39) is electrically
5 connected to one end of Resistor 36 (R36), and the other end is electrically connected to the igniter; one end of Resistor 36 (R36) is electrically connected to Pin 2 of the master chip (MCU) and one end of Resistor 55 (R55), the other end of Resistor 55 (R55) is electrically connected to +4.5V output of DC stabilized power supply (1); one end of the said Resistor 40 (R40) is electrically connected
10 to one end of Resistor 35 (R35) and one end of Resistor 41 (R41) respectively, and the other end of Resistor 40 (R40) is electrically connected to another igniter; the other end of Resistor 35 (R35) is electrically connected to Pin 3 of the master chip (MCU) and one end of Resistor 54 (R54), and the other end of Resistor 54 (R54) is electrically connected to +4.5V output of DC stabilized power supply
15 (1); the other end of Resistor 41 (R41) is electrically connected to the base electrode of Triode 5 (Q5) and one end of Resistor 42 (R42) respectively, the other end of Resistor 42 (R42) is electrically connected to the emitter electrode of Triode 5 (Q5) and one end of Resistor 43 (R43) respectively, the emitter electrode of Triode 5 (Q5) is connected to +2.7V output DC voltage of DC
20 stabilized power supply (1), the other end of Resistor 43 (R43) is electrically connected to one end of Capacitor 12 (C12), the positive end of Electrolytic Capacitor 7 (E7) and the collector electrode of Triode 5 (Q5) respectively, and the base electrode of Triode 5 (Q5) provides working voltage to the igniter.

6. The gas valve timing shut-off device for gas stove according to Claim 2,
25 is characterized in that the said execution circuit (8) comprises the driver chip (IC2), Relays 1-6 (J1-J6), Resistors 44-53 (R44-R53), Diodes 12-15 (D12-D15), Inductive Coils 2-5 (L2-L5), Electrolytic Capacitor 8 (E8) and Electrolytic Capacitor 9 (E9); wherein, the model of the said driver chip (IC2) is ULN2001 and it totally has eight pins, Pin 1 of the driver chip (IC2) is electrically

connected to Pin 8 of the master chip (MCU) through Resistor 37 (R37) and Resistor 33 (R33), Pin 2 of the driver chip (IC2) is electrically connected to Pin 7 of the master chip (MCU) through Resistor 38 (R38) and Resistor 34 (R34), Pin 7 of the driver chip (IC2) is electrically connected to one end of Relay 3 (J3) and Relay 6 (J6) respectively, the other end of Relay 3 (J3) and Relay 6 (J6) both are connected to +4.5V DC voltage outputted by DC stabilized power supply (1), Pin 8 of the driver chip (IC2) is electrically connected to one end of Relay 1 (J1), Relay 2 (J2), Relay 4 (J4), and Relay 5 (J5) respectively, and the other end of Relay 1 (J1), Relay 2 (J2), Relay 4 (J4), and Relay 5 (J5) are connected to +4.5V DC voltage outputted by stabilized power supply (1); the normally open contact of Relay 1 (J1) is electrically connected to one end of Resistor 44 (R44), and its control end is electrically connected to one end of Inductive Coil 2 (L2) and the negative electrode of Diode 12 (D12) respectively, the other end of Resistor 44 (R44) is connected to +4.5V DC voltage outputted by DC stabilized power supply (1), the other end of Inductive Coil 2 (L2) is grounded, and Inductive Coil 2 (L2) is wound onto the solenoid valve (M1) controlled by it; the normally open contact of Relay 2 (J2) is electrically connected to one end of Resistor 45 (R45), and its control end is electrically connected to one end of Inductive Coil 3 (L3) and the negative electrode of Diode 13 (D13) respectively, the other end of Resistor 45 (R45) is connected to +4.5V DC voltage outputted by DC stabilized power supply (1), the other end of Inductive Coil 3 (L3) is grounded, and Inductive Coil 3 (L3) is wound onto the solenoid valve (M2) controlled by it; the normally open contact of Relay 3 (J3) is electrically connected to one end of Resistor 46 (R46), its control end is electrically connected to the positive end of Electrolytic Capacitor 8 (E8), and its normally closed contact is electrically connected to one end of Resistor 47 (R47) and Resistor 48 (R48) respectively, the negative end of Electrolytic Capacitor 8 (E8) is grounded, the other end of Resistor 47 (R47) is electrically connected to the positive electrode of Diode 13 (D13), and the other end of Resistor 48 (R48) is electrically connected to the

positive electrode of Diode 12 (D12); the normally open contact of Relay 4 (J4) is electrically connected to one end of Resistor 49 (R49), its control end is electrically connected to one end of Inductive Coil 4 (L4) and the negative electrode of Diode 14 (D14) respectively, the other end of Resistor 49 (R49) is connected to +4.5V DC voltage outputted by DC stabilized power supply (1), the other end of Inductive Coil 4 (L4) is grounded, and Inductive Coil 4 (L4) is wound onto the solenoid valve (M3) controlled by it; the normally open contact of Relay 5 (J5) is electrically connected to one end of Resistor 50 (R50), its control end is electrically connected to one end of Inductive Coil 5 (L5) and the negative electrode of Diode 15 (D15) respectively, the other end of Resistor 50 (R50) is connected to +4.5V DC voltage outputted by DC stabilized power supply (1), the other end of Inductive Coil 5 (L5) is grounded, and Inductive Coil 5 (L5) is wound onto the solenoid valve (M4) controlled by it; the normally open contact of Relay 6 (J6) is electrically connected to one end of Resistor 51 (R51), its control end is electrically connected to the positive end of Electrolytic Capacitor 9 (E9), and its normally closed contact is electrically connected to one end of Resistor 52 (R52) and Resistor 53 (R53) respectively, the negative end of Electrolytic Capacitor 9 (E9) is grounded, the other end of Resistor 52 (R52) is electrically connected to the positive electrode of Diode 15 (D15), and the other end of Resistor 53 (R53) is electrically connected to the positive electrode of Diode 14 (D14).