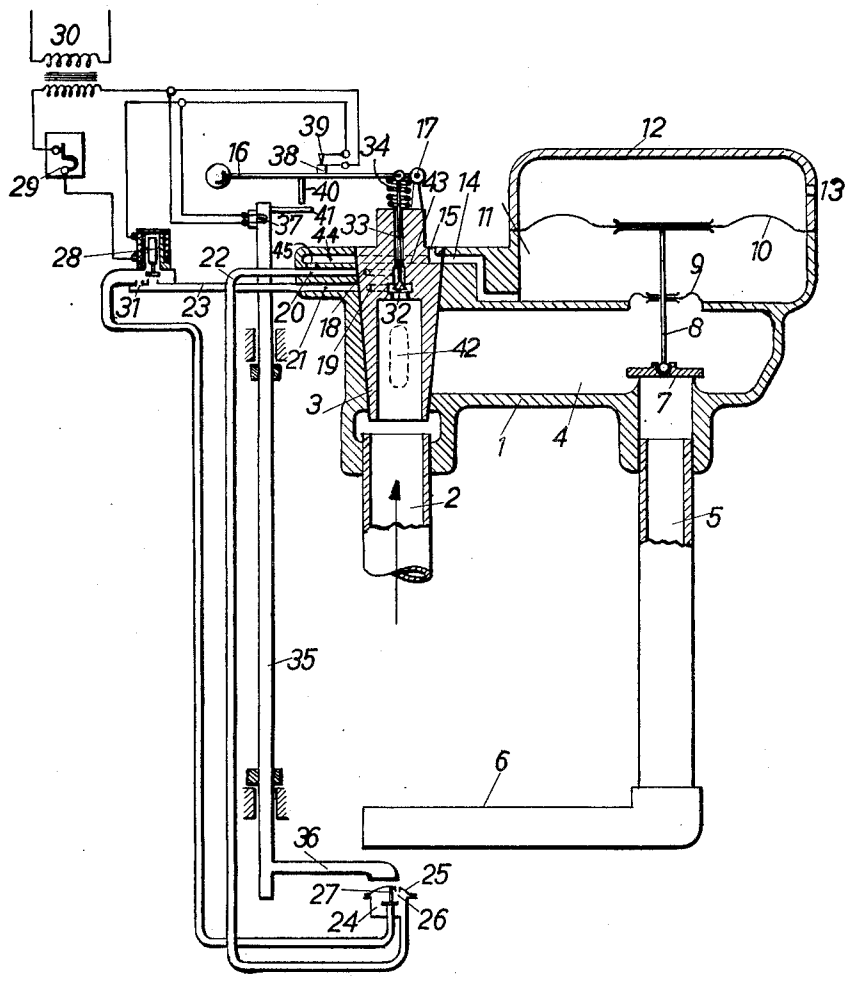
Dec. 22, 1942. E. DOBLER 2,305,848

LIGHTER FOR GAS HEATERS

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Fig.1



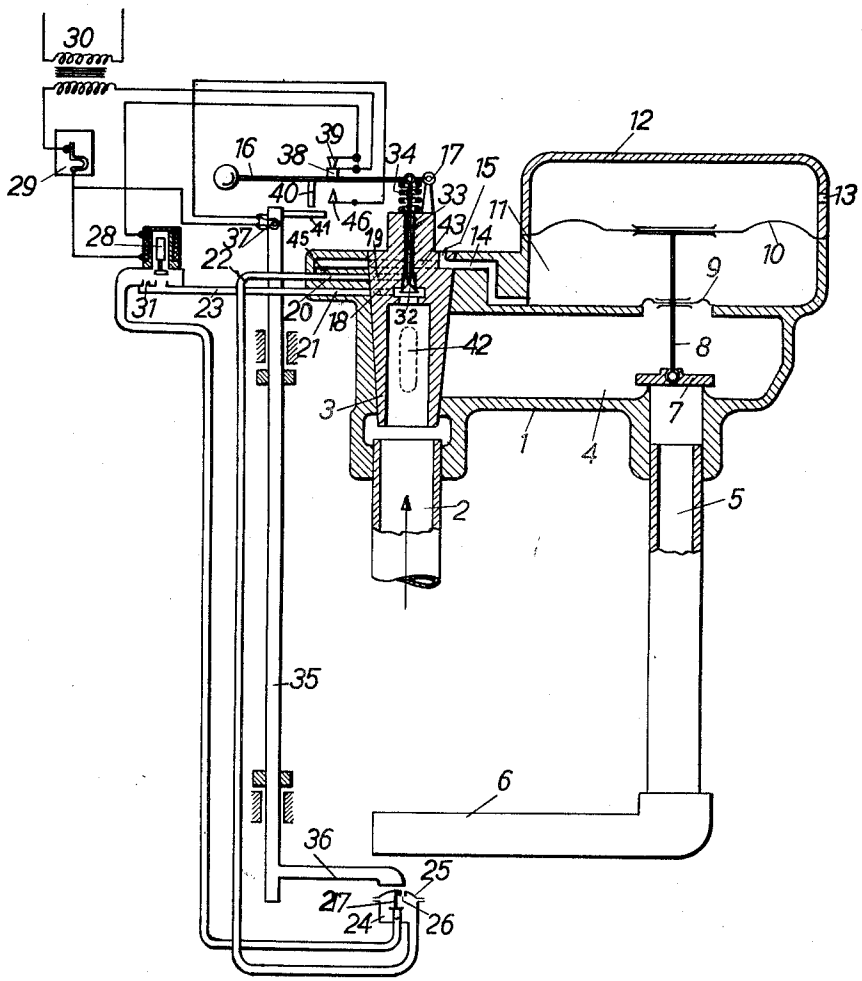
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Fig.2



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Fig.3

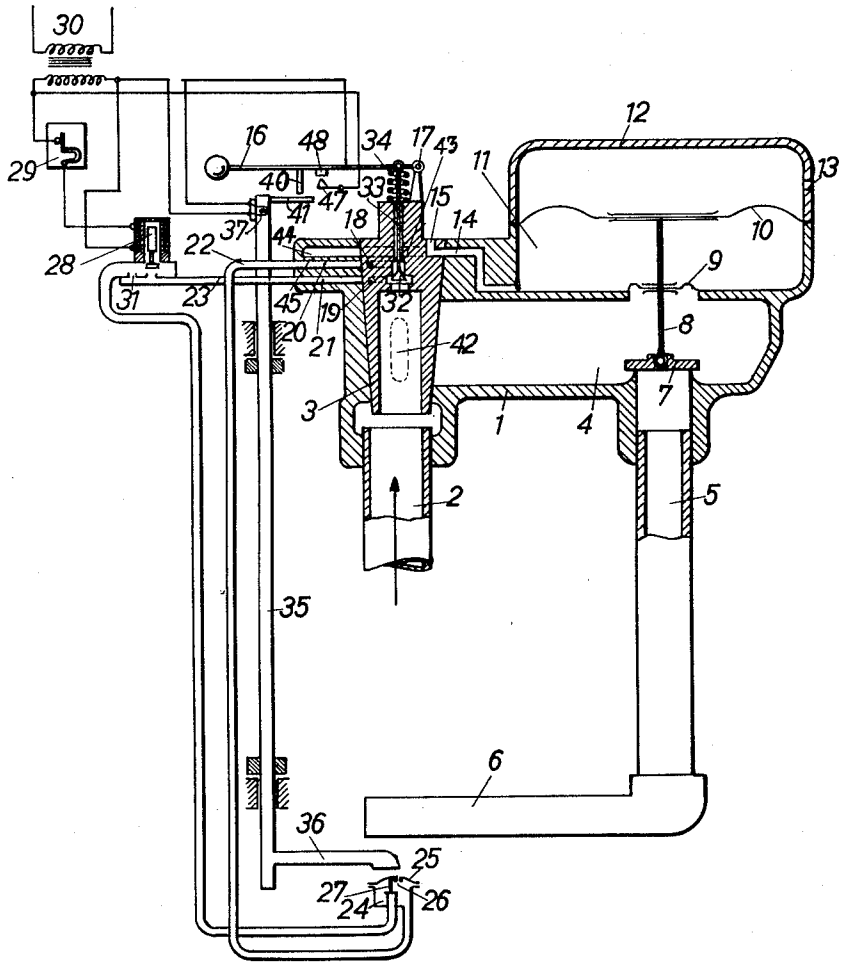
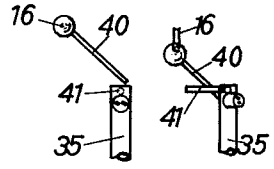


Fig.4 Fig.5



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LIGHTER FOR GAS HEATERS

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Fig. 6.

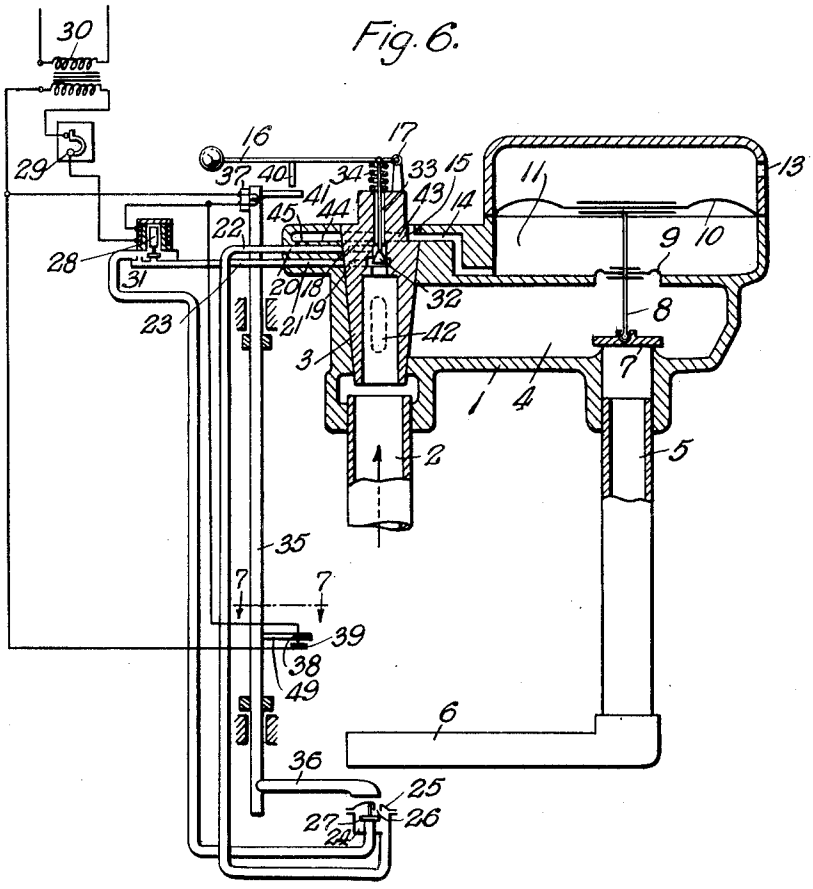
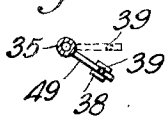


Fig. 7.



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LIGHTER FOR GAS HEATERS

Erich Dobler, Dessau, Germany; vested in the Alien Property Custodian

Application July 28, 1939, Serial No. 287,143
In Germany August 6, 1938

11 Claims. (Cl. 158—115)

This invention relates to lighting arrangements for gas-heated apparatus.

It is an object of the invention to provide an improved arrangement for igniting burners by means of a flash-over action.

Another object of the invention is to provide a movably arranged flash-over tube which after flash-over ignition is returned into a neutral position wherein its intake end is out of the way of the lighted flame.

A further object of the invention is to provide an electrical lighter which is controlled in accordance with the movement of the flash-over tube into and out of operative position.

A still further object is to provide an electrical lighter for gas-heated apparatus in combination with an electromagnetically controlled gas valve.

A still further object is to provide gas-heated apparatus having in combination an electrical lighter and a gas valve controlled in subordination to a room-temperature thermostat.

According to the invention a flash-over ignition device includes a flash-over tube wherein a movably arranged member which is used for the purpose of flash-over ignition is so arranged that for ignition purposes it is moved into collecting position and returned after said ignition into its neutral position in which the intake end of the flash-over tube is out of the way of the lighted flame, an electrical lighter being provided the electrical circuit of which is closed when the movably arranged member is moved into operative position for flash-over ignition.

In this manner the gas-heated apparatus is set fully in operation solely by actuating the movable member and the arrangement according to the invention has the advantage that there is no need to keep a lighting device permanently turned on in an undesirable and detrimental manner inasmuch as the lighting device is turned off in any event by the movable member as it is returned into its original position. Moreover, owing to the short time the lighting device is turned on the consumption of current is only very small so that a small and therefore cheap source of current can be employed.

In gas apparatus controlled by an electro-magnetically actuated valve it is preferable to locate the lighting device in the circuit of said valve so that the wiring for the lighting device may be simplified and both magnet-valve and lighting device can be supplied with current from a common source.

Contacts may be provided for switching on the lighter and so arranged that when current is supplied to the lighter no current is supplied to the electro-magnet valve.

If the electro-magnet valve be controlled by a room-temperature thermostat the electric lighter can be connected in series with the source of current with the result that after the apparatus has been completely cut out of operation the ignition flame can still be lit by means of the lighter even through the thermostat continues to maintain the circuit it controls open.

To enable the invention to be fully understood it will now be described with reference to the accompanying drawings, in which typical embodiments of the invention are illustrated, and in which:

Fig. 1 shows an arrangement with the lighter arranged in the flash-over tube in series connection with an electromagnetically controlled gas valve and a room-temperature thermostat;

Fig. 2 shows an arrangement for the ignition device with a switch contact for switching off the magnet valve,

Fig. 3 shows an arrangement for the ignition device in series connection with the source of current.

Figs. 4 and 5 are fragmentary views looking toward one end of the operating lever, showing it in normal and depressed positions, respectively.

Fig. 6 is a view, similar to Fig. 1, of a further modification, and

Fig. 7 is a fragmentary sectional view taken on the line 7—7 of Fig. 6.

The arrangement according to Fig. 1, consists of a casing 1 to which is attached a gas-supply pipe 2. The supply of gas is controlled by a cock spigot 3, rotatably mounted in the casing and is adapted to flow into a chamber 4 communicating through a pipe 5 with the main burner 6. The pipe 5 is opened or closed by a diaphragm valve 7 actuated by differences of pressure in a control passage. The valve 7 is connected by means of a stem 8 with a diaphragm 9 forming a gas-tight seal between the chambers 11 and 4 and a diaphragm 10 which is adapted to form a gas-tight seal between the chamber 11 and the atmosphere. A cover 12 with a vent 13 is mounted above the diaphragm 10.

In Fig. 1 the spigot 3 is shown in the closed position, the whole arrangement being therefore out of action. In such case the chamber 11 is in communication with the atmosphere through a passage 14 and a passage 15 in the spigot 3 so that the diaphragm valve 7 is closed. When the apparatus is to be put in operation

the spigot 3 is turned to a predetermined extent by means of a lever 16 which is rotatable with the spigot and also adapted to be swung about a horizontal axis 17. On rotation of the spigot 3 by the lever 16 the passages 18, 19 (indicated by broken lines) in the spigot 3 are placed in communication with the passages 20, 21. Connected with the passages 20, 21 are pipes 22, 23 both of which open into the casing 24 of an ignition valve which is normally closed by a flexible diaphragm 25 having an ignition nozzle 26 and a valve 27 for closing the end of the pipe 23. Located in the pipe 23 is an electromagnetically controlled valve 28 which is controlled by a room-temperature thermostat 29 and fed from a source of current 30 consisting, for example, of a transformer.

In the above described first operative position of the spigot 3 the gas first enters only through the passages 19, 21 to the pipe 23 and thence through the opened control valve 28, or should this be closed through a throttle 31 arranged adjacent to the valve seating as far as the end of the pipe 23 closed by the valve 27. Consequently no ignition can take place. The passage 18 in the spigot 3 is at first still shut off from the main gas supply by a valve 32 which is provided with a stem 33 articulated to the lever 16 and held in the closed position by a spring 34. Depressing the lever 16 about the axis 17 opens the valve 32 so that the gas can now flow through the passages 18, 20 and pipe 22 to the nozzle 26 and there be ignited. The ignition takes place through a flash-over tube 35 which is rotatable about its vertical axis and secured against axial displacement and carries on the lower end a collector tube 36 which when in the ignition position lies with its inlet over the nozzle 26 but which is out of reach of the ignition flame after the ignition has been effected.

The ignition device comprises a filament 37 located at the upper end of the flash-over tube 35 and is connected in series in the circuit of the magnet valve 28. Two contacts 38, 39 are provided for controlling the current to the filament 37. According to Fig. 1 on the lever 16 being depressed the contacts 38, 39 are separated so that current flows to the filament 37 which becomes incandescent whereas when the lever 16 is in normal position the contacts 38, 39 remain closed even if the spigot 3 be rotated by the lever 16.

The lever 16 is also provided with a downwardly extending rod 40 inclined (see Figs. 4 and 5) at an angle in relation to the vertical. Attached to the flash-over tube 35 is a horizontal arm 41 in such a manner that when the lever 16 is in normal position, the rod 40 can be moved freely above the arm 41. When the lever 16 is set in the above described position for the first adjustment of the spigot 3 the rod 40 is in position above the arm 41 so that when the lever 16 is depressed said rod bears against the arm 41 and accordingly presses it sideways thus rotating the flash-over tube 35. In so doing the collector tube 36 is moved into its operative position above the nozzle 26 so that the gas issuing from the nozzle ascends inside the flash-over tube 35 and since depressing the lever 16 results in the filament 37 being raised to incandescence, the flame flashes over and lights the ignition flame. This flame heats the diaphragm 25 the curvature of which accordingly increases and causes the valve 27 to be lifted from its seating so that the gas can now flow to the nozzle by way of the pipe 23. If the lever 16 be returned into its original position the contacts 38, 39 are again closed and the filament 37 is short-circuited whilst the flash-over tube is returned to its original position for example by means of a spring not shown in the drawings. Simultaneously with the raising of the lever 16 the valve 32 is again closed so that the supply of gas to the nozzle now proceeds by way of the pipe 23 only.

After the ignition flame has been lit the spigot 3 is further turned by means of the lever 16 into its full-on position in which position the communication between the passages 19, 21 is maintained and the supply pipe 2 is connected with the chamber 4 of the casing through an opening 42 in the cock. At the same time communication between the chamber 11 and the outside air through the passage 15 is automatically shut off and the passage 14 is connected by way of a passage 43 in the spigot 3 with a passage 44 provided in the casing and communicating with the pipe 22 through a throttle 45. In view of the throttling action of the nozzle 26 the gas reaching the casing 24 through the pipe 23 will be more than is required for the ignition flame and a portion of this gas will enter the pipe 22 and pass the throttle 45 into passages 44, 43 and 14 into the chamber 11 thereby lifting the diaphragm 10 and opening the valve 7 so that the gas can now flow to the main burner 6 through pipe 5 where it is lit by the ignition flame.

The contacts 38, 39 may, of course, be located in other positions and actuated in other ways than shown in Fig. 1. For example (see Figs. 6 and 7) they may be actuated by rotation of the flash-over tube or by the rotation of the burner in cases where the flash-over tube is not adapted to rotate. As shown in Figs. 6 and 7, movable contact 38 is carried by an arm 49 provided on the flash-over tube 35 so that contact 38 makes contact with contact 39 to de-energize lighter 37 when the flash-over tube is in its neutral or inoperative position. When the flash-over tube is rotated to its operative position for flash-over ignition, the contacts 38—39 are interrupted and the lighter is energized.

The arrangement according to Fig. 2 differs from that shown in Fig. 1, in that there is provided a switch contact 46 and in that the filament circuit and the circuit of the electromagnetic valve 28 are so arranged that on depressing the lever 16 the said valve 28 is put out of action by the separation of gas contacts 38, 39 and the filament 37 is switched on by the closing of the contacts 38, 46 so that the incandescence of the filament 37 is ensured even when a very small source of current is employed.

In the arrangement according to Fig. 3 the filament 37 is connected in series with the source of current 30, two contacts 47, 48 being so arranged that they close and switch on the filament 37 only when the lever 16 is depressed. The result of this arrangement is that after the apparatus has been put completely out of action the ignition flame can be lit by means of the filament 37 even though the circuit to the valve 28 is opened by the room-temperature thermostat 29.

Having thus described the nature of the said invention and the best means I know of carrying the same into practical effect, I claim:

1. Flash-over ignition apparatus for gas burners comprising a flash-over tube movably mounted adjacent a gas burner and having an intake end which is movable into collecting position rel-

ative to said burner for ignition purposes and movable into neutral position out of the way of the flame from said burner after ignition, said tube being provided with an electrical lighter, an electrical circuit including a source of current and electrical contacts for said lighter, and manual means for moving said flash-over tube to operative position for flash-over ignition and for actuating one of said contacts to energize said electrical lighter when the flash-over tube is in operative position for flash-over ignition.

2. Flash-over ignition apparatus as set out in claim 1 including a gas valve for said burner, the means for operating the flash-over tube also operating the gas valve, said means normally maintaining said contacts closed to short circuit the lighter, said means being operable to separate said contacts to energize said lighter when the flash-over tube is moved to operative position for flash-over ignition.

3. Flash-over ignition apparatus as set out in claim 1 including an electromagnetically controlled gas valve for controlling the flow of gas to said burner and in which said circuit includes said electromagnetically controlled valve, a manually operable gas valve for said burner, and means for operating said last-mentioned valve, said valve-operating means also operating said flash-over tube and said contacts whereby when the flash-over tube is in operative ignition position current is supplied to the lighter but the supply of current to the electromagnetically controlled valve is interrupted.

4. Flash-over ignition apparatus as set out in claim 1 in which the means for operating the flash-over tube includes a lever and in which one of the contacts is connected with said lever.

5. Flash-over ignition apparatus as set out in claim 1 in which the lighter contacts are controlled by a member connected to the movably mounted flash-over tube.

6. Flash-over ignition apparatus as set out in claim 1 including a gas valve for said burner, and means for operating said valves, said operating means also operating the flash-over tube and one of said contacts.

7. Flash-over ignition apparatus as set out in claim 1 including an ignition burner and a main gas burner and valve means for said burners, and means for operating said valve means, said operating means also operating the flash-over tube and one of said contacts.

8. Flash-over ignition apparatus as set out in claim 1 including a main gas burner and a gas valve for said burner, the means for operating the flash-over tube and for actuating one of said contacts also actuating said valve and being carried thereby.

9. Flash-over ignition apparatus as set out in claim 1, including electrical means for controlling the supply or gas to the burner, an electric circuit for said control means connected in series with the electrical circuit of said lighter, the contacts in the lighter circuit being normally closed to short-circuit the lighter, said contacts being separated to energize said lighter when the flash-over tube is moved into operative position for flash-over ignition.

10. Flash-over ignition apparatus as set out in claim 1 including electric means for controlling the supply of gas to the burner, an electric circuit circuit for said control means connected in parallel with the electric circuit of the lighter and including contacts whereby the lighter circuit is closed when the flash-over tube is in operative ignition position while the electric circuit of said control means is broken.

11. Flash-over ignition apparatus as set out in claim 1 including electrical means for controlling the supply of gas to the burner, an electric circuit for said control means connected in parallel with the electric circuit of said lighter, the contacts arranged in the lighter circuit being operable to close said circuit when the flash-over tube is in operative position for flash-over ignition.

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