March 28, 1939. J. E. BROWNING 2,152,531

GAS STOVE BURNER MECHANISM AND IGNITING MEANS

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Fig. 1.

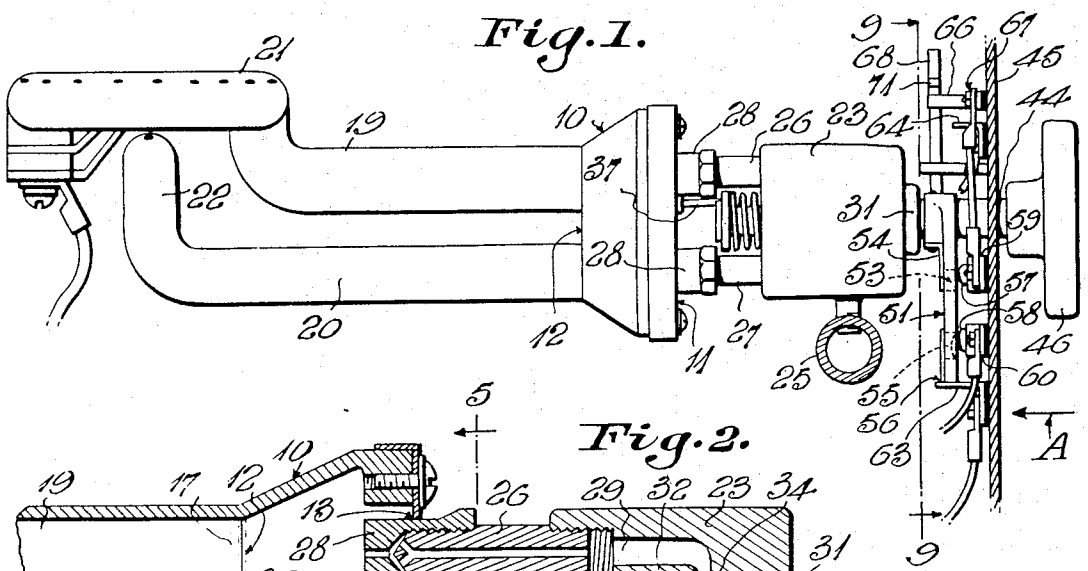


Fig. 2.

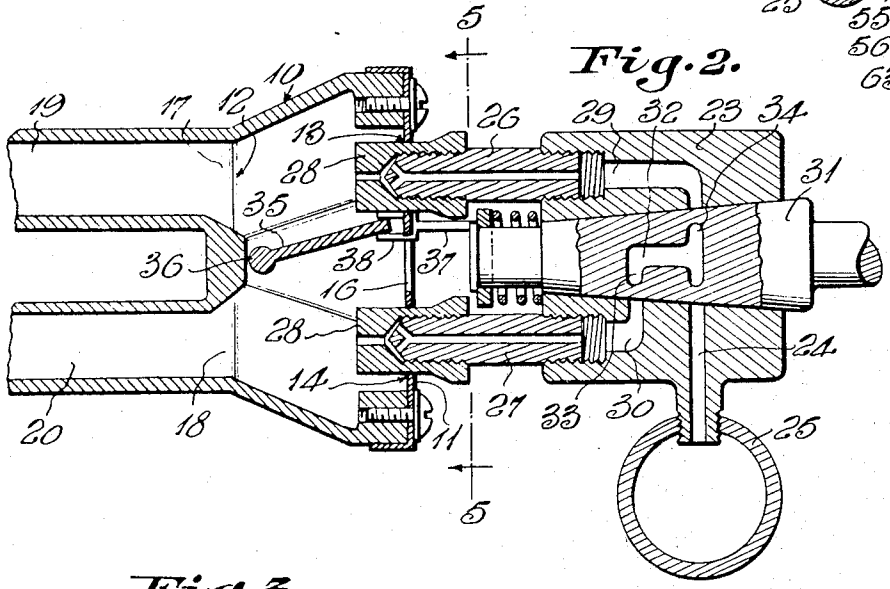
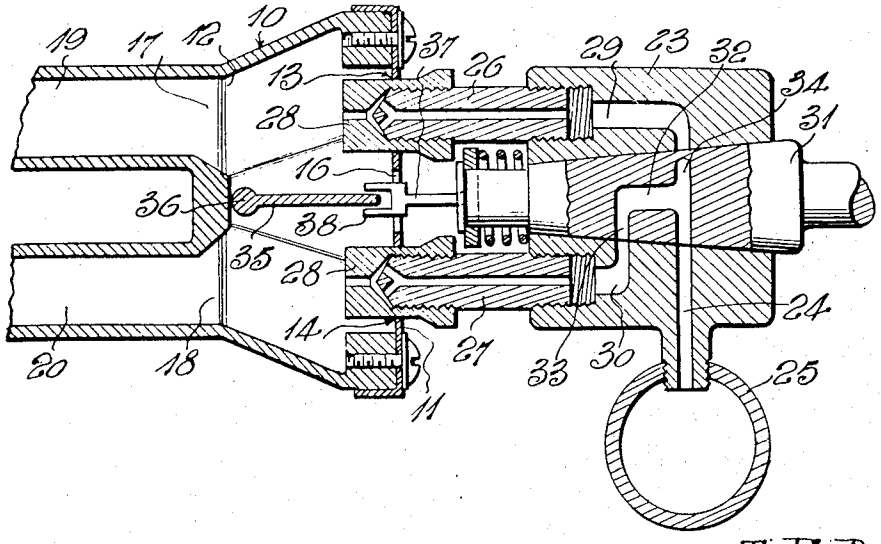


Fig. 3.



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Fig. 4.

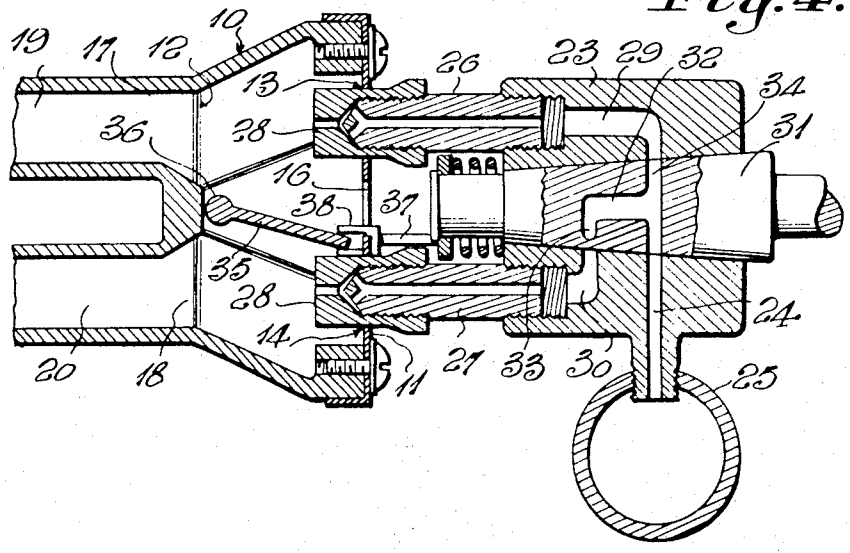


Fig. 5.

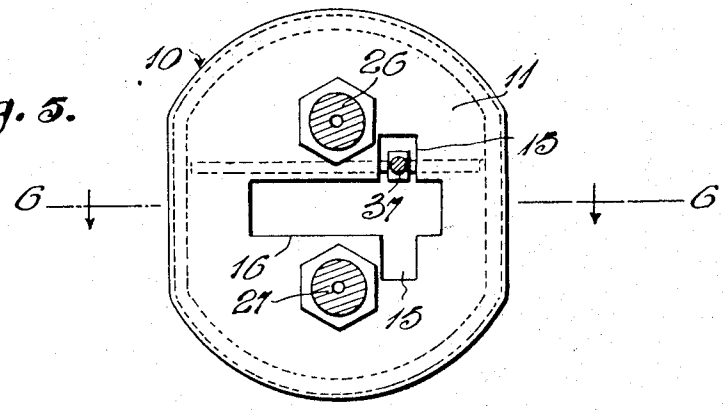
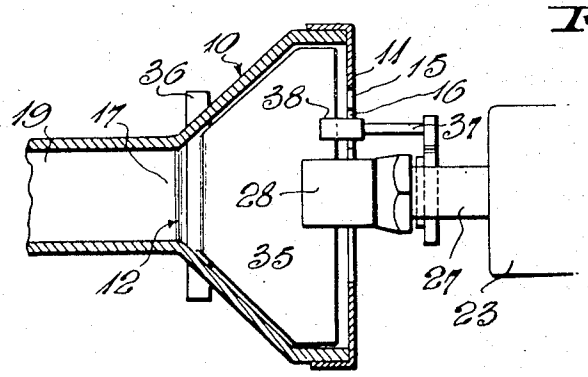


Fig. 6.



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Fig. 7.

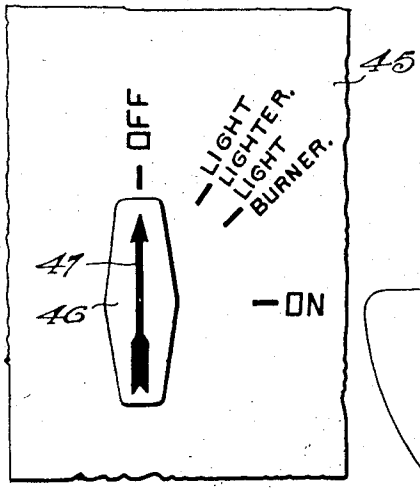
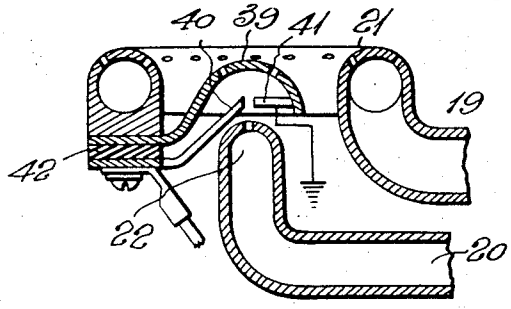


Fig. 9.

Fig. 8.



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UNITED STATES PATENT OFFICE

2,152,531

GAS STOVE BURNER MECHANISM AND IGNITING MEANS

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Application January 27, 1938, Serial No. 187,322

3 Claims. (Cl. 158—118)

The invention relates to a new and improved burner mechanism adapted primarily for use on gas stoves, although not restricted to this particular field of use.

A main burner is provided, and an igniting burner is employed for said main burner, and one object of the invention is to make novel provision for directing the gas and the primary air first to said igniting burner and for later directing the gas and primary air to said main burner after lighting said igniting burner, causing said main burner to be ignited by the flame from said igniting burner.

A further object is to provide a novel combination of elements for insuring automatic lighting of the igniting burner when the gas and air are supplied to this burner.

With the foregoing and minor objects in view, the invention resides in the novel subject matter hereinafter described and claimed, description being accomplished by reference to the accompanying drawings.

Fig. 1 is a side elevation partly in section.

Fig. 2 is an enlarged vertical sectional view through the valve mechanism and associated parts, in "gas-off" position.

Fig. 3 is a view similar to Fig. 2 but showing the parts positioned for supplying gas only to the igniting burner.

Fig. 4 is a view similar to Figs. 2 and 3 but showing the parts positioned for supplying gas only to the main burner.

Fig. 5 is a vertical transverse sectional view on line 5—5 of Fig. 2.

Fig. 6 is a detail horizontal section on line 6—6 of Fig. 5.

Fig. 7 is a fragmentary front elevation as indicated by the arrow A in Fig. 1.

Fig. 8 is a detail vertical section through the main and igniting burners and the ignition means associated therewith.

Fig. 9 is a transverse section on line 9—9 of Fig. 1 showing the ignition switch mechanism and illustrating the induction coil, electrodes, wiring, etc. in diagram.

In the drawings above briefly described, a preferred construction has been shown, and while this construction will be rather specifically explained, it is to be understood that variations may be made within the scope of the invention as claimed.

The numeral 10 denotes an air and gas mixer of substantially frusto-conical form, the front wall of said mixer being denoted at 11 and its rear wall at 12. The front wall 11 is formed with upper and lower openings 13 and 14 respectively, with a vertical slot 15, and with a horizontal primary air admission slot 16 communicating with said vertical slot. The rear wall 12 is formed with upper and lower mixture outlets 17 and 18 with which the fuel conducting pipes 19 and 20 of a main burner 21 and an igniting burner 22, communicate, said main burner 21 being preferably of annular form and the igniting burner 22 being preferably disposed centrally below said main burner.

In advance of the mixer 10 is a fixed valve body 23 having a port 24 communicating with the gas manifold 25 of the stove. The body 23 carries upper and lower gas discharge nipples 26 and 27 respectively, which pass through the openings 13 and 14 in alinement with the outlets 17 and 18, each of said nipples 26 and 27 being preferably provided with an adjustable tip 28 for controlling the discharge of gas. Ports 29 and 30 in the body 23 lead to the nipples 26 and 27 respectively, and a rotatable valve member or plug 31 is mounted within said body to control communication between the gas supply port 24 and said ports 29 and 30, the port 32 of said valve member or plug 31 being provided with an end 33 registrable with the port 30 and with an end 34 registrable with the ports 24 and 29. When the plug or the like 31 is in one position (Fig. 3), it directs the gas only to the nipple 27 to supply this gas to the igniting burner 22; when said plug is turned somewhat further, it supplies gas to the nipple 26 to feed it to the main burner 21, without entirely cutting off the supply of gas to the igniting burner 22, and when said plug or the like is turned still further (Fig. 4), it cuts off the supply of gas to said igniting burner 22 and directs the gas in desired quantity to said main burner 21.

A primary air directing plate 35 is disposed in the air and gas mixer 10 and extends from the rear wall 12 to the front wall 11 thereof, the rear edge of said plate 35 being pivotally mounted as denoted at 36 to allow said plate to swing upwardly and downwardly between the inwardly projecting ends of the nipples 26 and 27. A crank 37 is suitably mounted on the inner end of the plug or the like 31, said crank passing through the slot 15 and being operatively connected with the front edge of the plate 35. This operative connection is preferably established by bifurcating the inner end 38 of the crank 37 to straddle the plate 35 loosely. The crank 37 is so positioned with respect to the plug 31 as to hold the plate 35 in the upper position of Fig. 2

when said plug is positioned to cut off the gas from both burners, and to downwardly swing said plate as the plug is turned to successively admit gas to said burners. Thus, when plug 31 admits gas only to the igniting burner 22, plate 35 is positioned as in Fig. 3 to properly direct the primary air to said igniting burner 22, and when said plug is positioned to direct the gas to the main burner 21, said plate is positioned as in Fig. 4 to properly direct the primary air to this burner. The front edge of the plate 35 preferably moves almost throughout the length of the slot 15 and to positions above and below the slot 16. Thus, the air entering through these slots for mixture with the gas, enters below the plate 35 when the gas is entering below said plate, and above said plate 35 when the gas is entering above said plate, and the air will at all times be controlled according to the amount of gas being admitted, to insure perfect combustion. The plate 35 also performs a further function of preventing flow of gas to one burner when it is intended that it shall flow only to the other. For example, with the parts set as seen in Fig. 4 and the main burner 21 operating, the ascending current of hot air around the burner 22 would tend to create a draft through the passage 20 were it not for the plate 35, and such draft would draw some of the gas from the air and gas mixer 10 through said passage 20 to the burner 22, keeping the latter constantly lighted, during operation of the main burner 21.

A dome-like perforated hood 39 of suitable metal is secured within the confines of the annular main burner 21 to receive the combustible mixture discharged from the burner 22, and two electrodes 40 and 41 are provided in said hood for igniting the gas when an electric spark is caused to jump between said electrodes. Electrode 41 in the present disclosure is grounded, and the electrode 40 is insulated at 42 from other metallic parts. A switch mechanism hereinafter described is mounted on the operating shank 44 of the plug or valve member 31, which shank passes through the usual front plate or panel 45 of the stove and is provided with an operating knob 46. This knob preferably carries a pointer 47 cooperating with indicating means on the plate 45, said indicating means preferably consisting of the words "Off", "Light lighter", "Light burner" and "On". The switch mechanism is such that when the knob 46 is turned to "Light lighter" position to direct gas to the igniting burner 22, said switch mechanism completes the ignition circuit for the electrodes 40 and 41, thereby igniting the gas discharged under the hood 39. When the knob 46 is turned to its "Light burner" position to direct most of the gas to the main burner 21 while still directing some to the burner 22, the switch mechanism breaks the ignition circuit, and this circuit remains broken while the knob is being turned more or less toward "On" position, according to the flame desired. The switch mechanism is also preferably such that it will insure an open circuit for the electrodes 40 and 41 when the knob 46 is being retrogradely turned to cut off the gas to the burner.

One switch mechanism illustrative of many which could be used, is shown. Used with this switch mechanism, is the usual induction coil, the primary winding of which is denoted at 49 and the secondary winding at 50. The switch mechanism preferably controls both the primary and secondary circuits and both of them are, of course, open when the knob 46 is in "Off" position, so that when the ignition circuit for any one burner of the stove is completed, it cannot complete the ignition circuit for any other burner, causing idle sparking at the spark gap thereof.

A switch body 51 which may be considered as formed from insulation is fixed to the shank 44 of the valve member or plug 31. The hub of this switch body 51 may be pinned at 52 to the shank 44. One contact 53 is carried by the body 51 and is grounded at 54 to the pin 52. Another contact 55 is secured to the body 51 and is provided with a portion 56 exposed at the edge of said body, said edge being concentric with the shank 44. One fixed contact 57 is cooperable with the contact 53, and another fixed contact 58 is cooperable with the contact 55, said contacts 57 and 58 preferably consisting of spring-pressed buttons or the like carried by metal strips 59 and 60 which are adjustably mounted at 61 and 62 upon the panel 45, being of course, insulated from said panel. Another fixed contact 63 mounted on and insulated from the panel 45, is cooperable with the contact 56.

The secondary circuit of the induction coil is completed and broken at the contacts 55, 56, 58 and 63. The primary circuit is completed and broken at the contacts 53 and 57, and at other relatively fixed and movable contacts 64 and 65 of an auxiliary switch. The contact 65 is carried by a spring arm 66 pivotally mounted at 67 upon the panel 45 and insulated from said panel. A vertically slidable actuating rod 68 is provided for the arm 66, said rod 68 being mounted in appropriate guiding means 69, being operatively connected at 70 with the switch body 51, and being provided with a lug 71 for operating the arm 66.

When the knob 46 is turned to "Light lighter" position, contact 53 engages contact 57, contact 55 engages contact 58, contact 56 engages contact 63, and lug 71 swings arm 66 downwardly to engage 65 with 64. Both the primary and secondary circuits for the ignition means are thus completed. When the knob 46 is turned to "Light burner" position, 53 moves out of contact with 57, 55 moves out of contact with 58, and 56 moves out of contact with 63. At about the same time, the lug 71 snaps over the end of arm 66 and thereafter occupies a position below said arm as long as the burner is lighted. When the shank 44 is being turned in a direction to cut off the supply of gas to the burner, the contacts 53, 55 and 56 necessarily sweep over the coacting contacts 57, 58 and 63, but before this movement, the lug 71 pushes upwardly on the arm 66, moving contact 65 out of engagement with contact 64, insuring an open circuit for the ignition coil to prevent idle snapping of a spark between the electrodes 40 and 41.

The arm 66 and the lug 71 preferably cooperate in such manner that said arm bends sufficiently to allow said lug to snap past said arm after moving 65 into engagement with 64 or moving 65 out of engagement with 64, but other suitable provision could of course be made for obtaining the same general result.

Any desired wiring may, of course, be employed and that diagrammatically illustrated in Fig. 9 for illustrative purposes, is readily understandable without requiring a specific explanation.

It will be seen from the foregoing that novel and advantageous provision has been made for carrying out the objects of the invention and

while preferred features have been disclosed, attention is again invited to the possibility of making variations within the scope of the invention as claimed.

I claim:

1. In a burner mechanism, a chamber having a primary air inlet, a main burner having a gas conducting passage in communication with said chamber, an igniting burner for said main burner also having a gas conducting passage in communication with said chamber, a gas valve having jets for directing gas across said chamber into either of said passages, a primary air directing plate movably mounted in said chamber for directing the primary air into either of said passages according to the passage into which the gas is being directed, and connecting means between said valve and said primary air directing plate whereby the latter is operated by the former.

2. In a burner mechanism, a chamber having a primary air inlet, a main burner having a gas conducting passage in communication with said chamber, an igniting burner for said main burner also having a gas conducting passage in communication with said chamber, a gas valve having jets for directing gas across said chamber into either of said passages, said gas valve having a valve member turnable in one direction to successively direct gas to the igniting and main burners and turnable in the other direction to shut off the supply of gas, a primary air directing plate movably mounted in said chamber for directing the primary air to either of said passages according to the passage to which the gas is being directed, and a crank carried by said valve member and operatively connected with said air directing plate for operating the same.

3. In a burner mechanism, an air and gas mixer having a front wall formed with upper and lower openings, with a primary air inlet and with a vertical slot, said mixer having a back wall formed with upper and lower mixture outlets alined with said openings of said front wall for conducting combustible mixture to two burners, a gas valve having upper and lower gas discharge nipples passing through said upper and lower openings, said gas valve having a rotatable plug for directing gas to either of said nipples, a primary air directing plate in said mixer extending from said back wall to said front wall and pivotally mounted at its rear edge to swing vertically between said nipples, and a crank on the inner end of said plug, said crank passing through said slot and being operatively connected with the front portion of said primary air directing plate, said crank being operable to swing said plate downwardly when said plug is rotated to discharge gas from said upper nipple and to swing said plate upwardly when said plug is rotated to discharge gas from said lower nipple.

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