United States Patent

[11] 3,592,179

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[54] **GAS IGNITER**
16 Claims, 14 Drawing Figs.

[52] U.S. Cl. 126/41, 431/6, 431/191, 431/263, 431/274
[51] Int. Cl. F23q 21/00, F24c 3/10
[50] Field of Search ..... 126/25 B, 39, 41; 431/191, 263, 274, 6

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ABSTRACT: Disclosed is a gas igniter for gas heated grills wherein gas is sucked from the grill into an ignition chamber by increasing the volume of a contractable chamber. The ignited gas is blown out of the chamber by decreasing the volume of the contractable chamber.

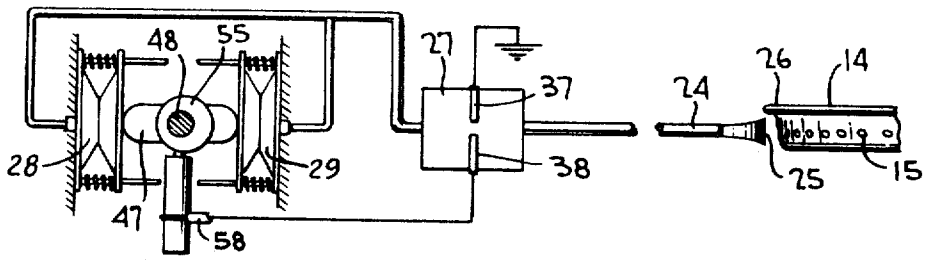


FIG. 1

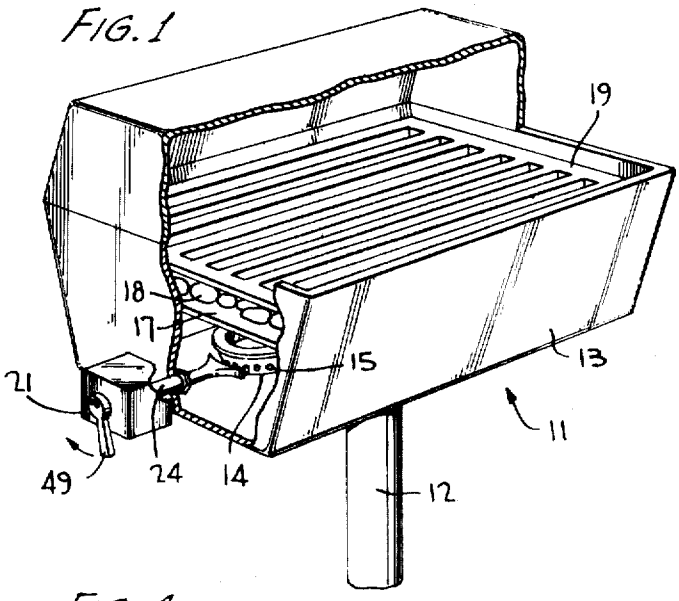


FIG. 2

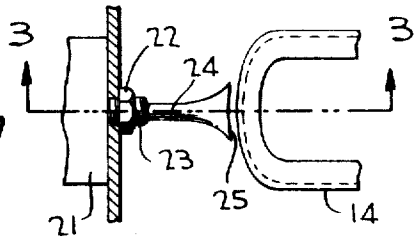


FIG. 3

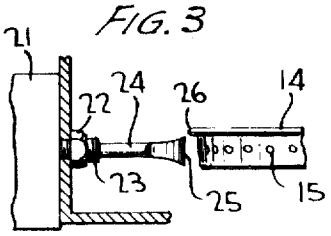


FIG. 4

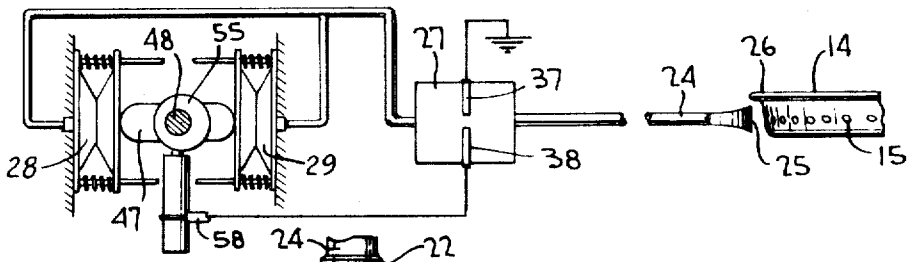
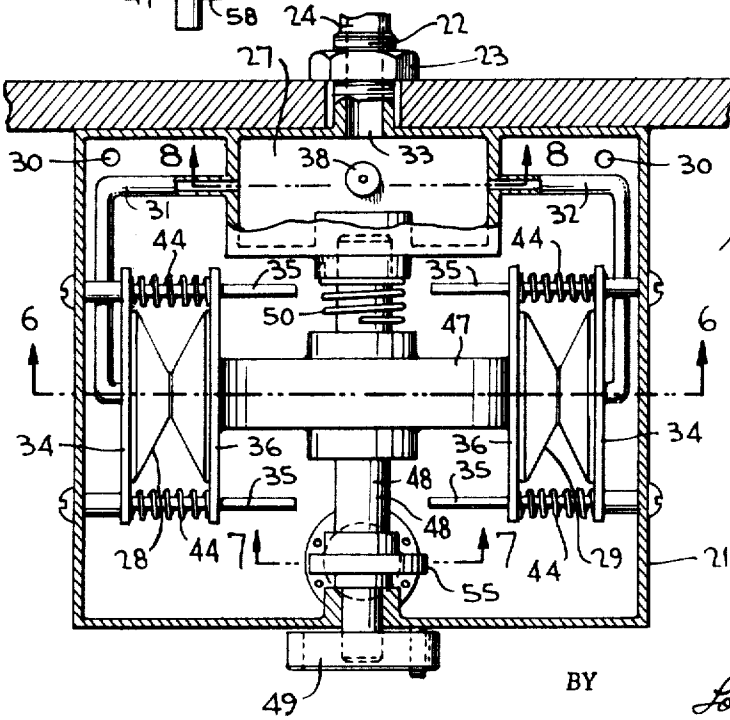


FIG. 5



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FIG. 6

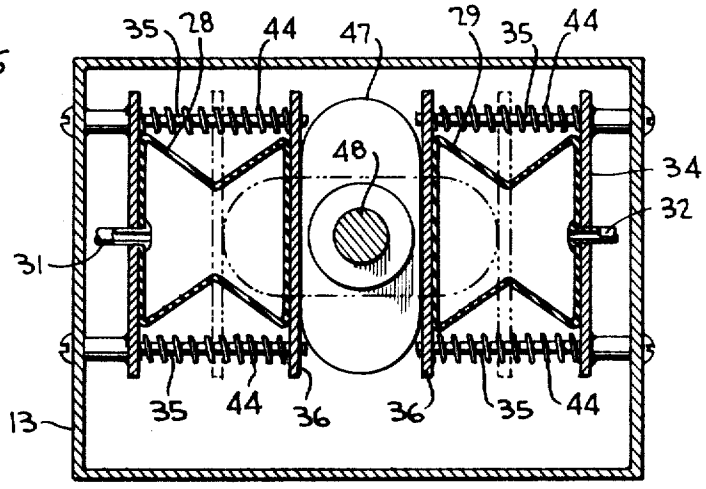
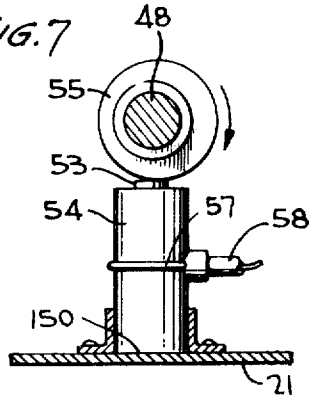


FIG. 7



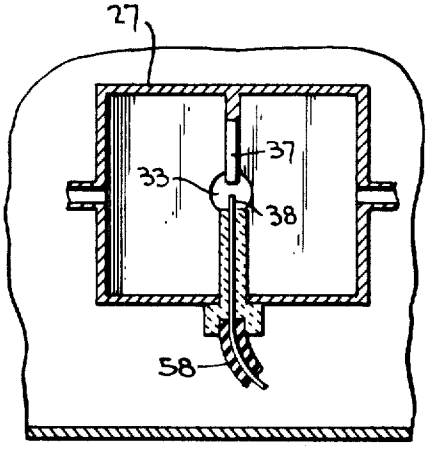


FIG. 8

FIG. 9

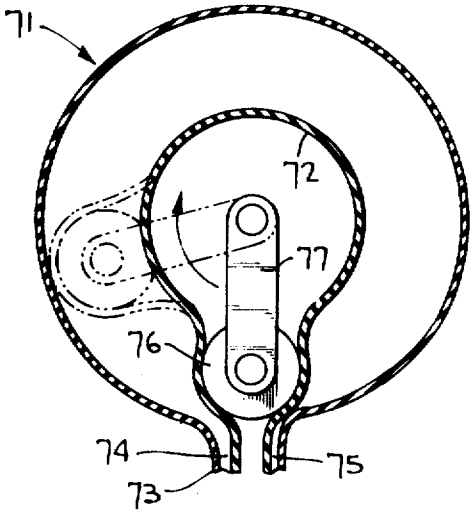
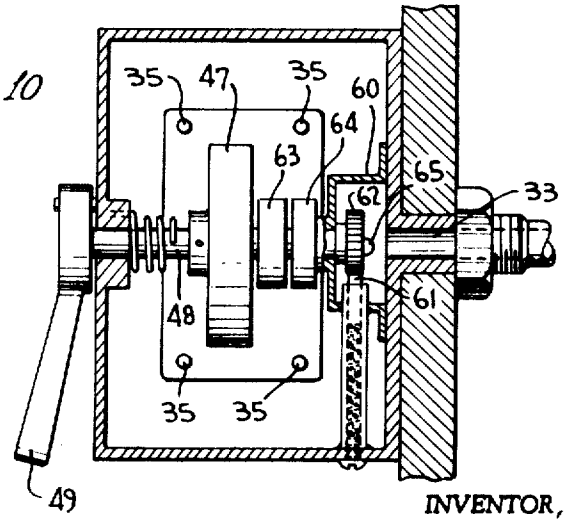


FIG. 10



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FIG. 11

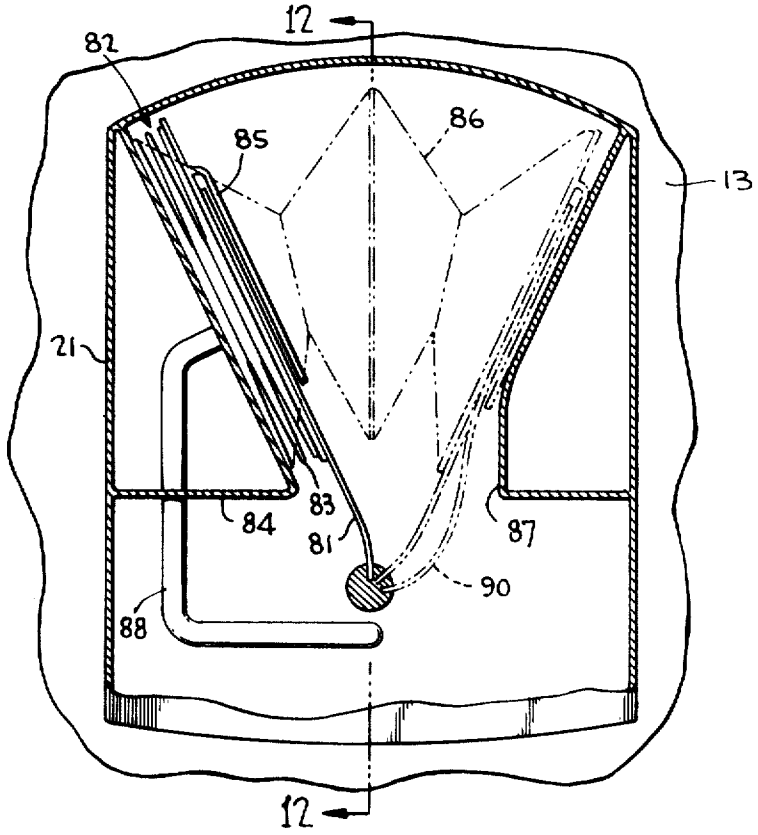


FIG. 12

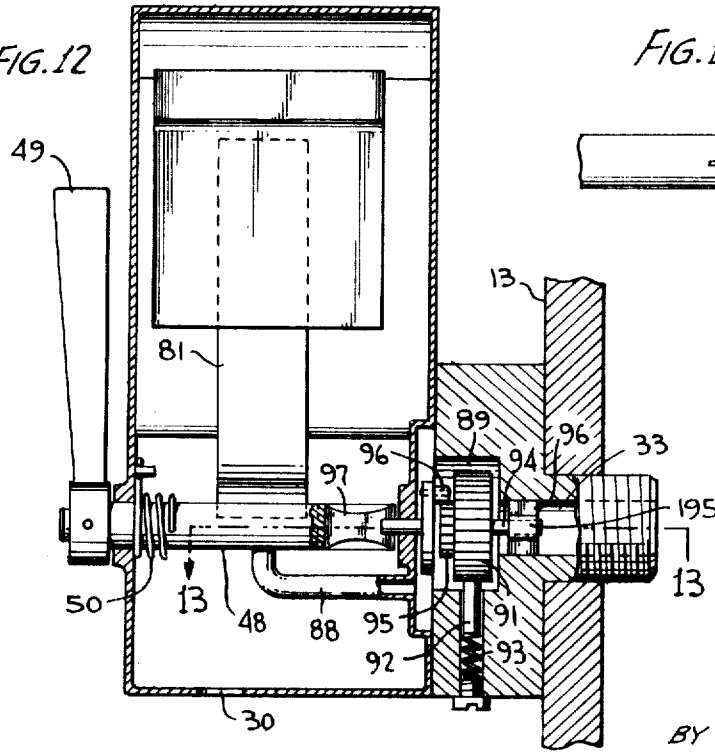


FIG. 13

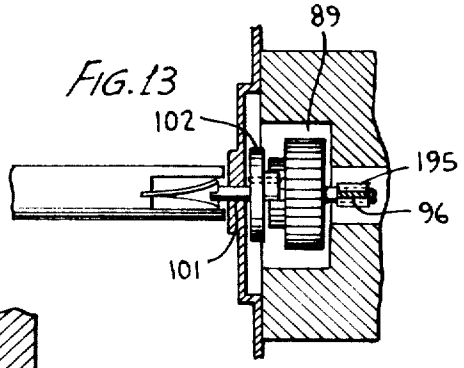
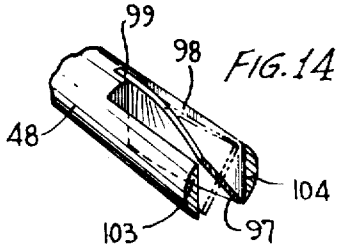


FIG. 14



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GAS IGNITER

The present invention relates generally to gas igniters and, more particularly, to a gas igniter wherein gas is sucked from a grill into an ignition chamber and the ignited gas flows back to the gas source.

Grills for cooking food in outdoor environments have recently received widespread use. These grills or furnaces are characterized by a burner unit having a multiplicity of apertures through which combustible gas under pressure, usually from a natural gas source, is forced. Typically, the burner is covered by a grating carrying a multiplicity of ceramic bricks, over which a grid is placed for carrying food to be cooked.

To avoid some of the dangers inherent with igniting a grill of this type with a match, an igniter has been developed utilizing a spark gap placed in proximity with the gas burner apertures. In one typical model, the spark gap for igniting the gas comprises a piezoelectric crystal which generates a high voltage in response to mechanical squeezing thereof. The high voltage is developed across the spark gap in close proximity to the gas burner apertures and causes spontaneous ignition of the gas in proximity thereto. The spark gap, being in close proximity with the gas burner apertures, is exposed to grease and dust particles from the food being cooked, as well as from other atmospheric contaminants. As grease and dust particles accumulate in the region of the spark gap and humidity varies in response to changing atmospheric conditions, it frequently develops that there is insufficient voltage to generate the spark for gas ignition. To maintain the conditions necessary for ignition with the prior art device, it is necessary to clean and maintain the spark gap periodically. Cleaning and maintenance of the spark gap can be achieved, however, only by removing the food grid and ceramic bricks, as well as the grid holding the bricks. In addition, it is occasionally necessary to disassemble the burner merely to gain access to the fixedly positioned spark gap.

In accordance with the present invention, these problems associated with prior art igniters for outdoor-type grills are obviated by providing a completely enclosed spark gap igniter for gas emerging from the burner apertures and locating the igniter at a region remote from the apertures. By enclosing the gas ignition spark gap chamber, grease and dust are not collected in the vicinity of the spark gap. The spark gap is enclosed and removed from the region immediately adjacent the gas burner apertures by providing means, in the form of an expansible chamber, for sucking gas from the burner apertures into the ignition chamber. After the gas has been sucked into the chamber, it is ignited and the ignited gas propagates as a wave front back to the burner apertures to cause complete ignition of gas in the burner.

As a feature of the invention, the ignited gas is positively forced out of, i.e., exhausted from, the ignition chamber after combustion has taken place. The ignited gas is forced out of the chamber by activating the sucking means so that it is operated in a reverse mode, so that the volume of the expansible chamber is reduced to exert a pressure against the ignited gas by air that has previously been sucked through the ignition chamber. By forcing the ignited gas out of the combustion chamber immediately after ignition has taken place, the possibility of fire is obviated and excessive heating of the igniter components is not likely to occur. Thereby, the unit is inherently provided with a safety feature and long life.

It is, accordingly, an object of the present invention to provide a new and improved gas igniter.

Another object of the invention is to provide a new and improved gas igniter particularly adapted for use with gas grills of the outdoor type wherein problems associated with accumulation of grease and dirt in the ignition area are obviated.

An additional object of the present invention is to provide a gas burner igniter wherein gas is sucked from the burner into a combustion chamber.

Still another object of the invention is to provide a new and improved gas igniter, particularly adapted for use with burners for cooking food, wherein ignited gas in a combustion chamber is forcibly blown therefrom to enhance the safety characteristics and long life of the combuster.

The above and still further objects, features and advantages of the present invention will become apparent upon consideration of the following detailed description of several specific embodiments thereof, especially when taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a perspective view, with a section partly broken away, of a typical grill of the prior art type, in combination with an igniter in accordance with the present invention;

FIGS. 2 and 3 are respectively top and side views illustrating the outlet end of the igniter of the present invention in combination with a typical prior art burner, with FIG. 3 being taken through the line 3–3 of FIG. 2;

FIG. 4 is a schematic view of the igniter of the present invention;

FIGS. 5 and 6 are respectively top and side sectional views of an igniter in accordance with an embodiment of the present invention utilizing a bellows as an expansible chamber, wherein FIGS. 5 and 6 show the bellows in expanded and contracted conditions, respectively, and FIG. 6 is taken along the line 6–6 of FIG. 5;

FIG. 7 is a side sectional view, taken along the line 7–7, FIG. 5, of the electrical mechanism for generating a voltage to produce a spark in the ignition chamber of the igniter illustrated by FIGS. 4—6;

FIG. 8 is a side sectional view, taken along the line 8–8, FIG. 5, of the ignition chamber;

FIG. 9 is a side sectional view of a modified expansible chamber for sucking gas from a burner into an ignition chamber and blowing the ignited gas back to the burner;

FIG. 10 is a side view of modified igniter wherein a flint and spark wheel are utilized to generate a spark;

FIG. 11 is a plan view, partly broken away, of still another embodiment of the present invention utilizing a single bellows;

FIG. 12 is a side sectional view of the embodiment of FIG. 11, taken through the lines 12–12 of FIG. 11;

FIG. 13 is a sectional view of a portion of the activator of the embodiment of FIG. 11, taken through the lines 13–13 of FIG. 12; and

FIG. 14 is a perspective view of the portion of the activator illustrated in FIG. 11.

Reference is now made to FIGS. 1—8 wherein there is illustrated a preferred embodiment of the present invention in combination with a grill 11 for heating or cooking food. The grill 11, FIG. 1, typically includes a standard 12 on which is mounted a housing 13 having an elongated gas burner 14 with a multiplicity of gas outlet apertures 15 around the periphery thereof. Combustible gas is supplied to burner 14 through a conduit, not shown, which extends through standard 12 from a suitable pipeline or bottled natural gas source. Mounted directly above burner 14 is grating 17 upon which ceramic bricks 18 are placed for enabling food positioned on grid 19 to have a charcoal appearance and taste.

To enable gas fed into burner 14 to be combusted as it emerges from burner apertures 15, gas igniter, mounted in metallic housing 21, is fixedly mounted by suitable means on one side of the housing for grill 11. Extending from housing 21 into the interior of the housing for grill 11 and into proximity with apertures 15 of burner 14 is gas line 24, having a diameter, position and connections to enable gas from the burner to be drawn into the igniter combustion chamber 27 through inlet port 33 of the chamber. A portion of pipe 24 extending through the grill housing has a threaded collar 23 on which nut 22 is threaded to hold the pipe in situ. Pipe 24 has an open end 25 flared both vertically and horizontally so that a relatively large volume, sufficient for ignition, of the combustible gas can be drawn from a substantial number of burner apertures 15 at the rounded edge of burner 14 that is in proximity with the open pipe end. The open end 25 of pipe 24 extends in

close enough proximity to apertures **15** and beneath the upper flange **26** of burner **14** to substantially prevent grease and dust from reaching the mouth and interior of the pipe. Typically, the interior diameter of pipe **24**, beyond the flared end **25**, is on the order of one-eighth inch to control the amount of air normally entrained therein to only a quantity sufficient for ignition within chamber **27**.

To remove some of the ambient air from within pipe **24** and ignition chamber **27** and and thereby more readily enable gas from burner apertures **15** to be sucked into the ignition chamber, housing **21** is provided with an expansible chamber in the form of a pair of sealed bellows **28** and **29**. Bellows **28** and **29** are preferably fabricated from a plastic coated material to provide the desired air seal. To enable bellows **28** and **29** to be easily expanded and prevent the buildup of back pressure within housing **21**, the igniter housing is provided with apertures **30** so that the interior thereof is at atmospheric pressure.

The interiors of bellows **28** and **29** are connected via lines **31** and **32** to opposed walls of ignition chamber **27**, having an inlet port **33** communicating with line **24** to enable gas to be drawn into the ignition chamber. The outside walls of baffles **28** and **29** are fixedly mounted to opposite plates **34** held in situ within the igniter interior by screws **35**. The inside free walls of baffles **28** and **29**, facing the interior of housing **21**, are secured to plates **36** so as to be driven by elongated cam **47** and compression springs **44** on screws **35**. Cam **47** is rotated from the horizontally disposed position illustrated in FIG. **5** to the vertically extending position of FIG. **6** by manually rotating handle **49** in the clockwise direction to turn shaft **48**. The handle **49**, shaft **48** and cam **47** are fixedly secured to each other and biased by coil spring **50**, coaxial with the shaft, so that the cam is normally horizontally disposed and baffles **28** and **29** are compressed. In response to rotation of handle **49** and shaft **48** to a stop for the handle, cam **47** is rotated 90° to the vertical position illustrated by FIG. **6**, whereby the free ends of baffles **28** and **29** are simultaneously pushed together towards the center of igniter housing **21** by springs **44**. In response to handle **49** being released, the free ends of baffles **28** and **29** are at the same time forced towards the outside faces of the igniter housing by the bias of spring **50**. In response to expansion of baffles **28** and **29**, ambient air is drawn from line **24** and sucked past ignition chamber **27** into the expanded baffles. As air is drawn from line **24**, gas flowing out of burner apertures **15** is sucked into the interior of the gas line and ignition chamber **27**. The volume of bellows **28** and **29** and of pipes **31** and **32** is such that there is sufficient air in lines **31** and **32** to prevent a substantial amount of gas from reaching the interior of the bellows to preclude substantially the possibility of gas ignition in the bellows.

With the bellows **28** and **29** almost in the fully expanded condition so that a substantial quantity of gas has been sucked into ignition chamber **27**, the gas in the chamber is ignited. To this end, ignition chamber **27** includes a grounded electrode **37** which forms a spark gap with electrode **38** to which a transient high voltage pulse can be applied, preferably by piezoelectric means operated in proper time sequence with opening of bellows **28** ans **29** to the desired extent. In response to the transient high voltage pulse being derived between electrodes **37** and **38**, gas in ignition chamber **27** is ignited to produce an ignited gas wave front which travels along line **24** to gas burner apertures **15** in proximity with the flared end **25** of line **24**.

To assure positively the propagation of the ignited gas from ignition chamber **27** back to the mouth **25** of line **24**, and prevent burning within chamber **27** for a substantial time interval, baffles **28** and **29** are compressed after the gas in chamber **27** has been ignited. Baffles **28** and **29** are compressed in response to release of handle **49** which occurs immediately after an operator rotates it to the stop. In response to release of handle **49** air is pushed out of the interior of baffles **28** and **29** as they are compressed and passes through lines **31** and **32** and ignition chamber **27** to force the ignited gas in the ignition chamber through pipe **24** into proximity with the burner aperture **15** proximate the flared mouth **25**.

To achieve gas ignition within chamber **27** and form a spark between electrodes **37** and **38** as baffles **28** and **29** are being forced to and retracted from their full open position, a piezoelectric high voltage source is provided. The piezoelectric generator comprises a cylinder **53** of certain bimetal piezoelectric crystals, such as telluride, embedded in a porcelain housing **54**. The upper surface of cylinder **53** is positioned to contact a circular metal wheel **55**, eccentrically mounted on shaft **48**, so that the crystal is variably compressed depending upon the angular position of handle **49**. Electrode **57** of crystal **53** is connected through insulated wire **58** to electrode **38** within ignition chamber **27**, while the bottom surface **150** of the crystal forms an electrode that is grounded by virtue of its electrical and mechanical connection metallic housing **21**, as illustrated in FIG. **7**. Thereby, the low voltage electrode **50** of crystal **53** and ignition electrode **37** are always at the same potential, and a DC connection exists between the crystal high voltage electrode **58** and high voltage ignition electrode **38**.

In response to handle **49** and shaft **48** being rotated from their initial position to the stop position, crystal **53** is squeezed sufficiently by wheel **55** to enable a high voltage, sufficient for ignition of the gas in chamber **27**, to be developed between electrodes **37** and **38**. In response to the handle **49** being released and rotation of shaft **48** back towards its initial position, the crystal again generates a large enough voltage for gas ignition. Hence, two sparks in close time sequence are generated between electrodes **37** and **38** for each rotation of handle **49** to assure positive ignition of the gas in the chamber. In operation, sufficient voltage for gas ignition is generated by crystal **53** across the spark gap in chamber **27** as bellows **28** and **29** are almost fully extended as handle **49** is rotated to approximately 5° of its stop. A similar voltage is generated in chamber **27** after handle **49** has been released and the bellows begin contracting.

In accordance with a modification of the invention, illustrated by FIG. **10**, the electrical ignition arrangement specifically illustrated by FIGS. **4—8** can be replaced with a mechanical igniter of the grinding wheel, flint-type, such as employed in a cigarette lighter. In the embodiment of FIG. **10**, ignition chamber **60** is mounted coaxially with shaft **48** and includes a flint **61** and grinding wheel **62** which is driven by shaft **48** and handle **49** through a four-to-one gear train **63** and slip clutch **64**. The slip clutch **64** is connected with shaft **48** in such a manner as to prevent turning of grinding wheel **62** until handle **49** has been rotated to within 10° of its stop. In response to handle **49** being rotated to within 10° of its stop, slip clutch **64** is engaged to rotate grinding wheel **62** through an angle of 40° for the last 10° of travel for the handle. It has been found that a 40° turn of grinding wheel **62** is sufficient usually to cause a spark to be generated between the grinding wheel and flint **61** to promote ignition of the gas within chamber **27**. In response to handle **49** being rotated back to its initial, starting position, a further spark is generated so that if the first one does not cause combustion, there is likelihood of combustion being derived from the second spark. In the drawing, FIG. **10** shows only the igniter mechanism and cam **47**, without a disclosure of baffles **28** and **29**. It is to be understood, however, that the baffles are included and are mounted on screws **35** in the manner illustrated by FIGS. **5** and **6** and connected via lines **31** and **32** to exhaust ports **65** in chamber **60**.

In accordance with another embodiment of the invention, the baffle arrangement of FIGS. **4—6** can be replaced with a suction device having a collapsible movable wall segment, as illustrated by FIG. **9**. In the embodiment of FIG. **9**, an annular airtight tube **71** having a flexible or collapsible inner wall **72** is provided. Tube **71** includes an inlet port **74** coupled via line **73** to an exhaust port in chamber **27** (similarly to the connection of one of lines **31** or **32** to chamber **27**) and a relief port **75**. Relief port **75** is normally closed by wheel **76** engaging

inner wall 72 to force the inner wall against the outer wall of tube 71 so that the relief port communicates with ambient air outside the interior of igniter 21 to prevent back pressure buildup. Wheel 76 is driven in a clockwise direction by shaft 48 with which it is connected by radial arm 77. There is thus provided a variable volume expansible chamber since the wheel squeezes a different section of flexible wall 72 against a portion of tube 71, depending upon the angular position of rod 77. With handle 49 in its normal initial position, wheel 76 is located in the position illustrated in FIG. 9 to provide a relatively large volume within tube 71 for air in pipe 24, ignition chamber 27 and port 33 of the ignition chamber. In response to rotation of handle 49 in a clockwise direction from its start position, wheel 76 is rotated in a clockwise direction, as illustrated in FIG. 9, to suddenly decrease the volume of tube 71 between inlet port 74 and the wheel without changing the amount of air in lines 24 or 73, as well as chamber 27. As wheel 76 is rotated further in the clockwise direction, the volume of tube 71 communicating with chamber 27 is increased but the amount of air in lines 24 and 73 and chamber 27 remains substantially constant. By increasing the volume within tube 71 for the air in lines 24 and 73 and chamber 27, air is sucked from the lines and ignition chamber 27 into the interior of the tube and the volume vacated by the sucked air is filled with gas from burner 15.

In response to wheel 76 being rotated a predetermined amount, gas within chamber 27 is ignited in accordance with either of the two previously discussed embodiments in response to handle 49 being rotated to a stop therefor. After the stop has been reached, handle 49 is released to rotate in the clockwise direction, back to its start position, and air within tube 71 is forced back out of port 74 through ignition chamber 27 and line 24, causing the ignited gas within the ignition chamber to flow back to burner apertures 15 in proximity with the mouth 25 of pipe 24.

Reference is now made to FIGS. 11—14 wherein there is illustrated still another embodiment of the present invention utilizing a single bellows and a spark wheel. In the embodiment of FIGS. 11—14, shaft 48 carries a generally radially extending, slightly flexible plastic arm 81. One end of arm 81 is fixedly secured to shaft 48 so that the arm is rotatable with the shaft. At the end of arm 81 remote from its connection with shaft 48 is mounted bellows assembly 82. Bellows assembly 82 includes an expansible section 83, having one exposed face rigidly connected to plate 84, fixedly mounted on the interior of igniter housing 21. The other exposed face of bellows 83 is provided with a hook 85, which extends from the end plate of the bellows and in a direction transversely of the bellows expansion direction, leaving adequate room for arm 81 to be inserted between the hook and the end face of the bellows.

The connection of arm 81 with bellows assembly 82 enables the bellows to be drawn from the closed position, illustrated in FIG. 11, to the open position indicated by dotted lines 86. With the bellows assembly 83 expanded, to the position indicated by dotted lines 86, hook 85 is rotated from a position in proximity to plate 84 to a position adjacent stop plate 87, proximate the wall of housing 21 opposite from that carrying plate 84. Air is sucked into bellows 83 by virtue of the connection of pipe 88 through an aperture in plate 84 to the interior of bellows assembly 82. Pipe 88 provides a gas flow path from the interior of bellows 83 through spark chamber 89, passage 33 and line 24 (not illustrated in FIGS. 11—14) to apertures 15 in burner 14.

Spark chamber 89 includes spark wheel 91 and flint 92 which is biased against the spark wheel by spring 93. One end of spark wheel 91 is mounted for rotation about an axis longitudinal with passageway 33 by virtue of a rigid connection between the spark wheel and shaft 94, mounted for rotation in bearing 195, carried by spider 96 in passageway 33. Spark wheel 91 is rotatably connected to shaft 48 through a one-way clutch comprising ratchet wheel 95, pawl 96 and torsion spring 97 which is connected between the pawl and shaft 48.

The ratchet, pawl and torsion spring connection between spark wheel 91 and shaft 48 is such that the spark wheel is rotated on an impulse basis by an amount sufficient to produce a spark in chamber 89 only after handle 49 has been rotated to open bellows assembly 82 completely. To this end, shaft 48 is provided with a longitudinal slot 98 in one end thereof. Within slot 98 and oriented 90° thereto, a further slot 99 for receiving one end of torsion spring 97 is provided. Torsion spring 97 is fixedly mounted in slot 99 at one end, while the other end of the torsion spring is fixedly attached to shaft 101, rigidly mounted on wheel 102 for carrying pawl 96. Slot 98 is cut in shaft 48 in such a manner as to enable rotation of the shaft 40° before both edges of torsion spring 97 come into contact with opposed slot edges. Thereby, a dead band of approximately 40° is provided between the rotation of shaft 48 and spark wheel 91 but the spark wheel is driven with a sudden turn of approximately 25° after the dead band region has been overcome. The 25° rotation of spark wheel 91 is sufficient usually to provide ignition from gases sucked into chamber 89.

In operation, an operator rotates handle 49 approximately 40° from the vertically extending position illustrated in FIG. 12 so that bellows assembly 82 is opened to the position indicated by dotted line 86, FIG. 11. As bellows 83 are opened, air in the line from the flared end 25 of pipe 24 is sucked into the bellows and gas from apertures 15 is sucked into combustion chamber 89. With handle 49 rotated about 40° to its fullest extent, shaft 48 is turned so that the opposite edges of torsion spring 97 are in contact with the opposed surfaces 103 and 104 forming the sidewalls of slot 98. Prior to the opposite edges of spring 97 engaging walls 103 and 104, spark wheel 91 is held stationary due to the frictional force exerted thereon by spring biased flint 92. In response to walls 103 and 104 coming into contact with the opposite edges of torsion spring 97, however, the energy stored in the torsion spring is released and suddenly imparted to spark wheel 91 through shaft 101, wheel 102, pawl 96 and ratchet wheel 95. Shaft 48 provides an added torque to the spark wheel assembly after bellows assembly 82 has become fully extended because bellows expander arm 81 has sufficient flexibility to function as a leaf spring and thereby enable it to slide slightly out of bellows hook 85, as shown by dotted line position 90, FIG. 11.

In response to the sudden application of force applied thereto, spark wheel 91 is suddenly rotated approximately 25° to produce a spark in chamber 89 and cause ignition of the natural gas sucked therein. The ignited has in chamber 89 flows back through bore 33 and pipe 24 to apertures 15 to ignite the gas escaping from the apertures. Simultaneously, the operator releases handle 49 and the handle returns to its initial vertical position due to the bias of return spring 50. As handle 49 and shaft 48 return to their initial position, the air in bellows assembly 82 is forced through pipe 88 and chamber 89 positively to push the ignited gas in the ignition chamber back into proximity with apertures 15 and ignite the burner.

As gas is being forced out of chamber 89 in response to contraction of bellows 83, spark wheel 91 remains stationary despite its connection to shaft 48 because of the inclusion of the one-way clutch comprising ratchet wheel 95 and pawl 96. Thereby, the spark wheel 91 is activated only once for each rotation of handle 49 to reduce wear to flint 92 and extend the flint life.

While there have been described and illustrated several specific embodiments of the invention, it will be clear that variations of the details of construction which are specifically illustrated and described may be made without departing from the true spirit and scope of the invention. For example, to further obviate the possibility of grease and other debris reaching the interior of pipe 24, the pipe can be extensible into and out of proximity with burner apertures 15. Further, other means for igniting the gas can be employed, such as a magneto geared with shaft 48 for generating a DC voltage to heat a resistive ignition wick within chamber 27. Further, the sucking bellows and tube can be replaced with an impeller geared with shaft 48.

I claim:

1. An igniter for combustible gas emerging from a gas burner comprising an ignition chamber for the gas, gas line means having one end in proximity to the gas emerging from the burner and a second end terminating in said chamber, means for drawing the emerging gas from the burner through the line into the chamber, and means operated in a predetermined time sequence with said drawing means for igniting gas drawn into the chamber, said line means being coupled with said chamber and burner for feeding ignited gas from the chamber back to the burner so that an ignited wave front propagates via the line means back to the burner to ignite gas emerging from the burner.

2. The igniter of claim 1 wherein said drawing means includes means for forcing the ignited gas out of the chamber after activation of the ignition means.

3. The igniter of claim 2 wherein said means for drawing further includes means for drawing ambient air out of the gas line and chamber while drawing the gas through the gas line and chamber.

4. The igniter of claim 3 wherein said drawing means includes: an expansible chamber, and means for expanding the volume of the expansible chamber to draw the gas into the ignition chamber and for reducing the volume of the expansible chamber to force the ignited gas out of the ignition chamber.

5. The igniter of claim 4 wherein said ignition means includes means for generating a first spark within the ignition chamber after the expansible chamber is opened and for generating a second spark within the ignition chamber as the expansible chamber is being closed.

6. The igniter of claim 5 further including coaxial actuators for said igniter means and expansible chambers.

7. The igniter of claim 4 wherein said igniting means includes: a rotatable shaft, spark generating means in said ignition chamber, and dead band means between said shaft and spark generating means for enabling a spark to be generated by said spark generating means only in response to the shaft being rotated through a predetermined angle.

8. The ignite of claim 7 wherein said expanding means includes a flexible arm rotatable with said shaft, and said expansible chamber includes hook means for receiving said arm and enabling the arm to be partially retracted from it.

9. The igniter of claim 8 further including a one-way clutch between said shaft and spark generating means.

10. The igniter of claim 8 wherein said dead band means includes a slot in said shaft and a torsion spring having one end fixedly mounted in a root of said slot and another end fixedly mounted to a drive means for said spark generating means, said spring being rotatable in said slot by said predetermined angle.

11. The igniter of claim 7 wherein said dead band means includes a slot in said shaft and a torsion spring having one end fixedly mounted in a root of said slot and another end fixedly mounted to a drive means for said spark generating means, said spring being rotatable in said slot by said predetermined angle.

12. The igniter of claim 1 wherein the one end of said gas line is outwardly flared.

13. A grill for heating and cooking with combustible gas comprising a burner for the gas, said burner having apertures for enabling gas to be combusted in the atmosphere, means for mounting noncombustible heat-retaining bricks in proximity to said burner, means for supporting an object to be cooked in proximity to said mounting means, an ignition chamber for the gas, a gas line having one end in proximity to apertures of the gas burner and a second end terminating in said chamber, means for drawing gas escaping from the burner apertures through the line into the chamber, and means operated in predetermined time sequence with said drawing means for igniting gas drawn into the chamber.

14. The grill of claim 13 wherein said drawing means includes means for forcing the ignited gas out of the chamber after activation of the ignition means.

15. The grill of claim 14 wherein said means for drawing further includes means for drawing ambient air out of the gas line and chamber while drawing the gas through the gas line and chamber.

16. A method of igniting combustible gas emerging from a source comprising the steps of sucking the gas from the source to an ignition chamber, igniting the gas in the chamber after it has been sucked into the chamber, and applying fluid pressure to the ignited gas in the chamber to force the ignited gas to flow out of the chamber back to the source.