

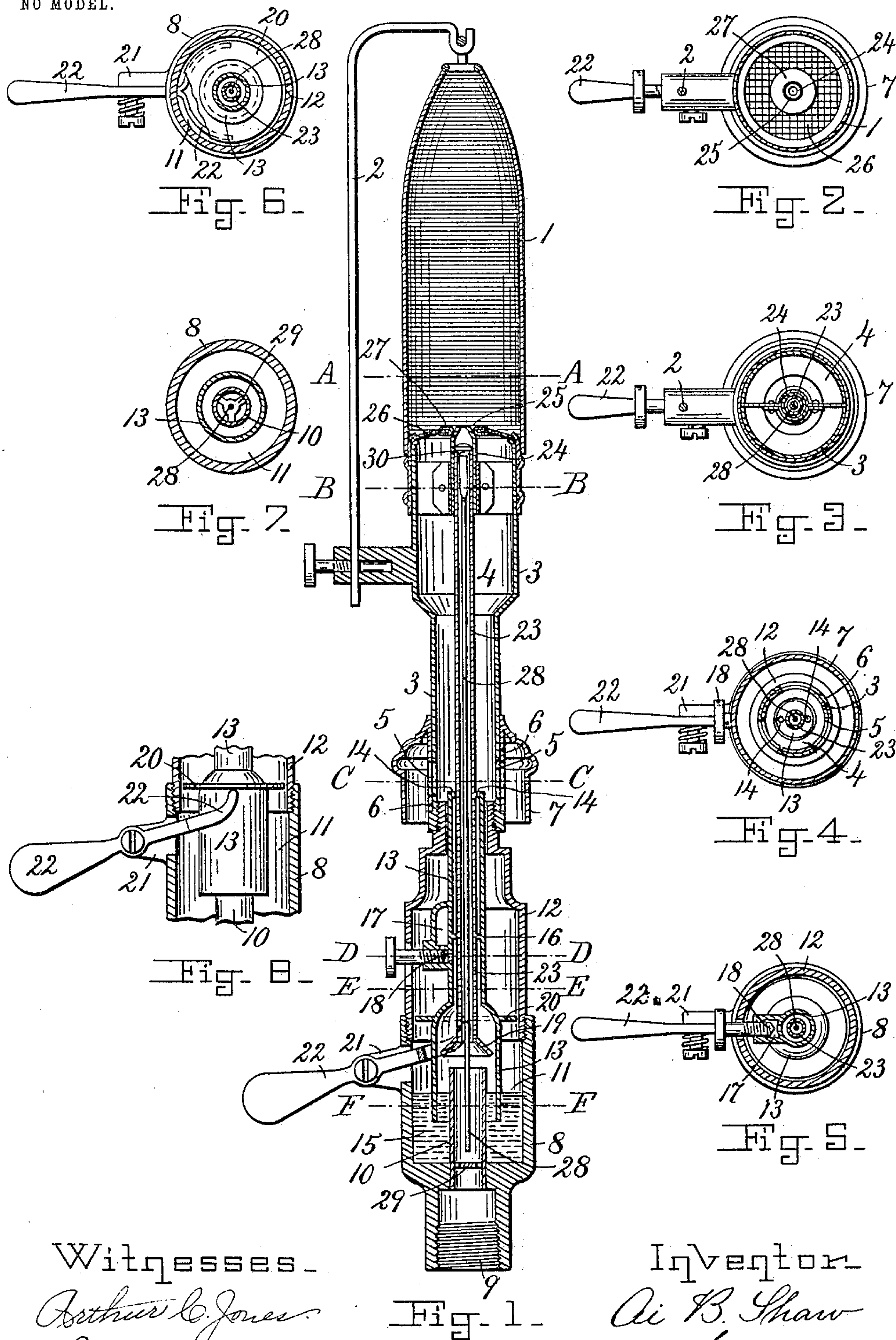
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PATENTED NOV. 15, 1904.

A. B. SHAW.  
GAS BURNER.

APPLICATION FILED JULY 5, 1902.

NO MODEL.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

AI B. SHAW, OF WEST MEDFORD, MASSACHUSETTS.

## GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 775,289, dated November 15, 1904.

Application filed July 5, 1902. Serial No. 114,488. (No model.)

*To all whom it may concern:*

Be it known that I, AI B. SHAW, of West Medford, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Gas-Burners, of which the following is a specification.

This invention relates to improvements in gas-burners, and more especially to gas-burners which are used in connection with a pilot-burner and are automatically lighted by the pilot-burner when turning on the gas to the main burner and are extinguished by the shutting off of the gas from the main burner.

The invention has for its objects to provide an effective, compact, convenient, and safe burner sure to maintain a supply of gas to the pilot-burner while the main burner is extinguished, and therefore sure to light the main burner, and it is one which is more particularly designed to be used in connection with a mantle, but may be arranged to be used without a mantle, if so desired.

The invention consists of the novel construction, arrangements, and combinations of parts, as will be fully described hereinafter and particularly set forth in the claims annexed, and it is carried out substantially as illustrated on the accompanying drawings, which form an essential part of this specification, like characters of reference referring to like parts wherever they occur on the different parts of the drawings.

On the drawings, Figure 1 represents a central longitudinal section of the complete burner provided with a mantle. Figs. 2, 3, 4, 5, 6, and 7 represent cross-sections respectively on the lines A A, B B, C C, D D, E E, and F F shown in Fig. 1. Fig. 8 represents a detail side elevation of a portion of the valve controlling the gas-supply and the mechanism used to operate the same and showing a portion of the casing of the burner in section.

This improved burner may be used in connection with and controlled by a time mechanism similar to those for which Letters Patent of the United States were and are to be issued to me bearing dates November 9, 1901, and July 8, 1902, the latter Letters Patent to contain an illustration of a burner substan-

tially coinciding with that of the accompanying drawings.

On the drawings I have illustrated the burner as provided with means whereby it may be operated by hand and independent of a time mechanism or any other means of operation.

The preferred form of the burner proper to be used in connection with my improved lighting mechanism is what is known as a "mantle" or "Welsbach" burner, and such a burner has been shown on the drawings; but other common and well-known forms of burners may be used in the place of the one shown, if so desired.

The mantle 1, its supporting-rod 2, the casing 3, containing the mixing-chamber 4, the air-inlets 5 to the mixing-chamber through the wall of the casing 3, the air-regulator 6, and the protecting-hood 7 for the inlets are substantially the same as those now in common use on mantle-burners.

Between the casing 3 of the burner and the gas-supply pipe on which the burner is or is to be attached is arranged a casing which contains the valve controlling the supply of gas to the burner, and this casing is preferably made in two parts, the lower part 8 adapted to be attached in any suitable manner to a gas-supply pipe, but preferably provided with the internally-screw-threaded portion 9, as shown. Within this lower portion of the valve-casing is an upwardly-projecting tube 10, which coincides with the inlet-opening for the gas into said casing and in connection with the casing itself forms an annular chamber or reservoir 11, surrounding said tube. It will be seen that the tube 10 forms an open inlet-passage for the admission of gas from the supply-pipe and into said casing. The upper portion 12 of the valve-casing is secured to the lower portion 8 and projects upward therefrom substantially in line with the gas-inlet. To the upper end of the portion 12 of the valve-casing is secured the casing 3 of the burner. Within the reservoir 11 and the upper portion 12 of the valve-casing is located a vertically-movable tube 13, the upper end of which is closed, with the excep-



tion of one or more small perforations 14, and is guided within a perforation in the upper portion of the valve-casing. The lower end of the tube 13 enters a body of mercury 15 or other liquid within the reservoir 11, which forms a liquid seal, preventing gas escaping from the inside of the tube at this place. The tube 13 constitutes a passage for the gas between the gas-inlet pipe and the casing 3 of the burner, into which casing the gas escapes from the tube 13 by means of the perforation 14. In order to regulate the flow of gas through the tube 13, I provide the tube with a dividing-partition 16 and have a by-pass or passage 17 around said partition connecting the tube on both sides of the partition, said passage being controlled by a regulating-valve 18, which can be adjusted so as to close said passage more or less and for convenience of operation projects through a slotted perforation in the wall of the casing 12.

Within the tube 13 is arranged a hood 19, which forms a valve controlling the supply of gas to the burner and engages the open top of the tube 10 when the tube 13 is moved downward by gravitation, as hereinafter described, and thus preventing gas from escaping from the tube 10 into the tube 13; but said hood withdraws from the top of the tube 10 when the tube 13 is moved upward, and thereby allows a free flow of gas into the tube 13 and its connections to the burner.

In order to move the tube 13, and thereby control the supply of gas to the burner, I provide the tube 13 with an annularly-projecting flange 20, which is of substantially the same size as the cross-sectional area of the interior of the upper part 12 of the valve-casing and forms a guide for the lower part of the tube in its vertical movements, the upper part of the tube 13 being guided within a perforation in the top of the valve-casing, as before stated. To an ear 21, projecting from the outside of the valve-casing, is pivotally attached the lever 22, preferably in such a manner that it will remain at any desired position to which it may be moved upon its fulcrum. The inner end of the lever 22 passes through a slotted perforation in the valve-casing, it being forked, so as to engage the under side of the flange 20 on opposite sides of the tube 13, and as the tube and the flange are circular it will be seen that the tube is free to turn upon the forked end of the lever 22. As the tube 13 is held in one position relative to the portion 12 of the valve-casing by the regulating-valve 18 projecting through a slot in the portion 12 and as the two portions of the valve-casing are preferably joined together by a screw-threaded joint, it will be seen that the annular flange upon the tube will allow the portion 12 to be turned to any position relative to the portion 8 when making the joint between said portions. The outer end of the

lever 22 may be made in the form of a handle, so as to be operated by hand, or it may be so shaped as to furnish means whereby any other operating mechanism may be attached to the lighting device. By providing the pivot of the lever with a friction device of the desired strength it will be seen that the lever may be moved to any desired place and will remain at any desired position.

Although I have shown the lever 22 as a preferred means to operate the tube 13 in order to admit gas to the burner or to shut off the gas from the burner, it will be understood that other means might be employed without departing from the essential feature of my invention.

In order to provide means whereby the gas admitted to the mantle of the burner by the upward movement of the tube 13 and its attached valve 19 will be ignited as soon as it reaches the combustion-chamber within the mantle, I provide the device with a pilot-burner located within the mantle and I supply and cut off the supply of gas to said pilot-burner in such a manner that the pilot-burner will be lighted when the gas which passes through the tube 13 and chamber 4 reaches the combustion-chamber in the mantle, so that the pilot-burner will be extinguished during the time the main burner is lighted and will be lighted by the main burner just before the downward movement of the tube 13 causes the cutting off of the supply of gas from the main burner. This pilot-burner and its operating mechanism are constructed and arranged substantially as follows:

A tube 23 is attached to and moves with the tube 13, being arranged within and projecting through the top of the tube 13 to a point near the upper end of the mixing-chamber 4. The lower end of the tube 23 projects through the hood 19 and is in open communication to the gas-inlet tube 11, so that gas will freely enter the tube 23 from said gas-inlet pipe 11 at all times. To the interior of the upper end of the casing 3 of the burner and centrally within the mixing-chamber contained therein is secured a tube 24 in such a manner that the upper end of the tube 23 is telescoped within the lower end of the tube 24 when the tube 13 and the attached tube 23 are moved vertically by its operating mechanism. The top of the tube 24 is located just below or so that it enters a perforation 25 made in the center of the gauze top 26 of the mixing-chamber, the gauze at this place being preferably provided with a metal binding or eyelet 27 for the purpose of adding strength and durability. It will thus be seen that gas escaping from the top of the tube 23 will pass up through the tube 24 and through the perforation 25 into the combustion-chamber in the mantle, where it will burn and constitute a pilot-burner.



In order to control the supply of gas to the pilot-burner through the tubes 23 and 24, I introduce a rod 28 into the tube 23, which rod is of less diameter than the interior diameter of the tube 23 and which rod extends from both ends of the tube, the lower end of the rod engaging a cross-plate or other stationary stop 29 in the tube 11 and limiting its movement when the tube 13 and attachments are moved downward by gravity, while the upper projecting end of the rod is provided with a head 30, which projects over the sides of the rod and by engaging the upper end of the tube 23 forms a valve closing the end of the tube against the escape of gas therefrom when the tube 13 and attachments are raised by the action of the operating mechanism. It will thus be seen that the rod with its projecting head in connection with the tube 23 forms a valve for controlling the supply of gas to the pilot-burner and that the action of the valve for the pilot-burner is directly opposite to the action of the valve controlling the supply of gas to the main burner and that when one is opened the other is closed by the action of the operating mechanism upon the tube 13 and the attachments to said tube.

By constructing the burner as above described it will be seen that there are no surfaces which move upon each other when turning on or shutting off the gas which are liable to become stuck together by the products of combustion collecting on said surfaces; that the liability to leakage of gas from the burner is reduced to a minimum; that the pilot-burner being located within the mantle of the main burner is not liable to be accidentally extinguished by air blowing against it; that the valve controlling the gas to the pilot-burner being located below the gauze of the main burner, which is the point of combustion of the pilot and main burner, is not liable to become fouled by the heat or products of combustion from the pilot or main burner; that by permanently attaching the tube which forms the pilot-burner to the casing of the main burner and having the upper end of the tube which conveys gas to the pilot-burner projecting into this permanently-attached tube when moved vertically to open or close the valve of the pilot-burner there is no danger of the movable tube becoming cramped within said permanently-attached tube by any warping or moving of the gauze of the main burner; that by this construction the pilot-burner will always register with the perforation in the gauze of the main burner; that the gauze can be renewed without disturbing the permanently-attached tube and at slight expense; that by having the guides for the vertically-movable tube made on the exterior of said tube and within the valve-casing sufficient space may be left between the vertically-movable tube and the gas-inlet tube to

prevent friction or said part being stuck together and will insure an easy movement of the moving tube; that by making the flange 20 fit loosely within the portion 12 of the valve-casing there will be sufficient lateral movement to insure the proper seating of the hood upon the end of the gas-inlet tube 11.

It will be understood that the main burner, with its gas-controlling valve, may be used without the pilot-burner when it is not desirable to have an automatic-lighting burner and that any common and well-known burner may be used in the place of the mantle-burner shown on the drawings.

Having thus fully described the nature, construction, and operation of my invention, I wish to secure by Letters Patent and claim—

1. In a gas-burner, a casing having an inlet-passage at one end to communicate with a gas-supply pipe, a burner at the opposite end of said casing, a reservoir for liquid, surrounding said inlet-passage, a vertically-movable tube having a passage for gas from said inlet and having its lower end sealed in said reservoir, a hood within said tube and attached thereto, held from engagement with the liquid in the reservoir at all times, but engaging and disengaging the end of said inlet-passage forming a valve to control the supply of gas to the burner, and means to raise and lower said vertically-movable tube.

2. In a gas-burner, a casing consisting of an upper portion and a lower portion connected together by a screw-threaded joint, a gas-inlet passage in the lower portion, a burner on the upper portion, a vertically-movable tube within said casing prevented from rotation in relation to said upper portion of the casing and carrying a valve controlling the supply of gas to the burner by the vertical movements of said tube and an annular flange projecting from the exterior of said vertically-movable tube, combined with an operating-lever fulcrumed to the lower portion of the casing having a forked end embracing said vertically-movable tube and engaging the flange thereon on opposite sides of the tube.

3. In a gas-burner, a casing having an inlet-passage at one end to communicate with a gas-supply pipe, a burner at the opposite end of said casing, a vertically-movable tube within said casing carrying a valve controlling the supply of gas to said burner by the vertical movements of said tube, and an annular flange projecting from the exterior of said vertically-movable tube, combined with an operating-lever fulcrumed to the casing having a forked end embracing said vertically-movable tube and engaging the flange thereon on opposite sides of the tube.

4. In a gas-burner, a casing having an inlet-passage at one end to communicate with a gas-supply pipe, a burner at the opposite end of said casing, a reservoir for liquid surround-



ing said inlet-passage, a vertically-movable  
tube forming a passage for gas from said in-  
let and having its lower end sealed in said  
reservoir, a hood within said tube and at-  
5 tached thereto held from engagement with the  
liquid in the reservoir at all times, but en-  
gaging and disengaging the end of said inlet-  
passage forming a valve to control the sup-  
ply of gas to said burner through said tube,  
10 and means to move said tube vertically, com-  
bined with a pilot-burner in close proximity  
to the main burner, a tube in open communi-  
cation with the gas-inlet passage attached to  
and movable with the vertically-movable tube,  
15 forming a gas-supply tube for the pilot-  
burner, a rod movable in this gas-supply

tube, a head on the rod to engage the top of  
said gas-supply tube to cut off the supply of  
gas to the pilot-burner when the vertically-  
movable tube is moved upward to supply gas 20  
to the main burner and a stop to stop the  
downward movement of said rod before the  
hood is sealed on the gas-inlet passage and  
cuts off the supply of gas to the main burner,  
in order to open the supply of gas to the pi- 25  
lot-burner.

In testimony whereof I have affixed my sig-  
nature in presence of two witnesses.

AI B. SHAW.

Witnesses:

RODNEY G. CHASE,  
HENRY CHADBURN.