Jan. 19, 1937. L. H. GEURINK 2,068,542

GAS RANGE BURNER IGNITION DEVICE

Filed Oct. 13, 1931 2 Sheets-Sheet 1

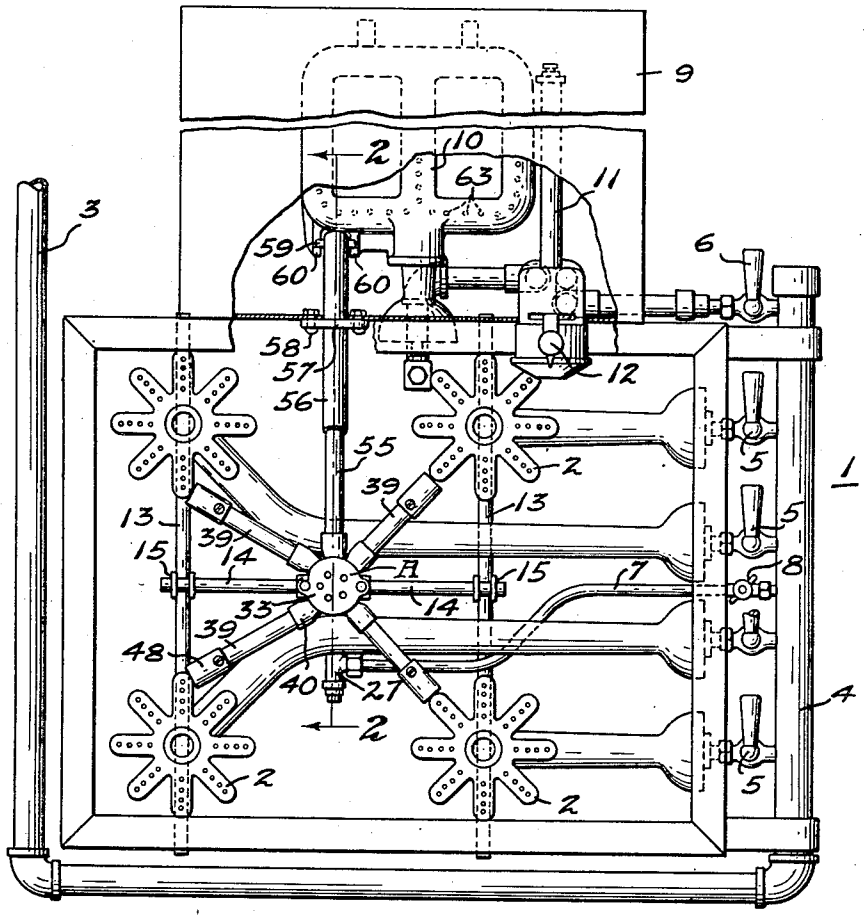


Fig. 1.

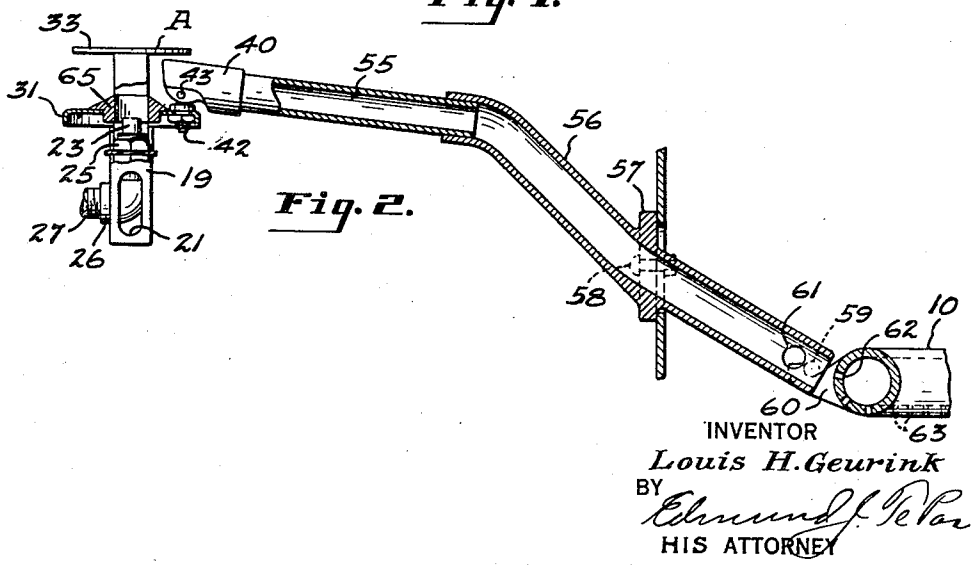


Fig. 2.

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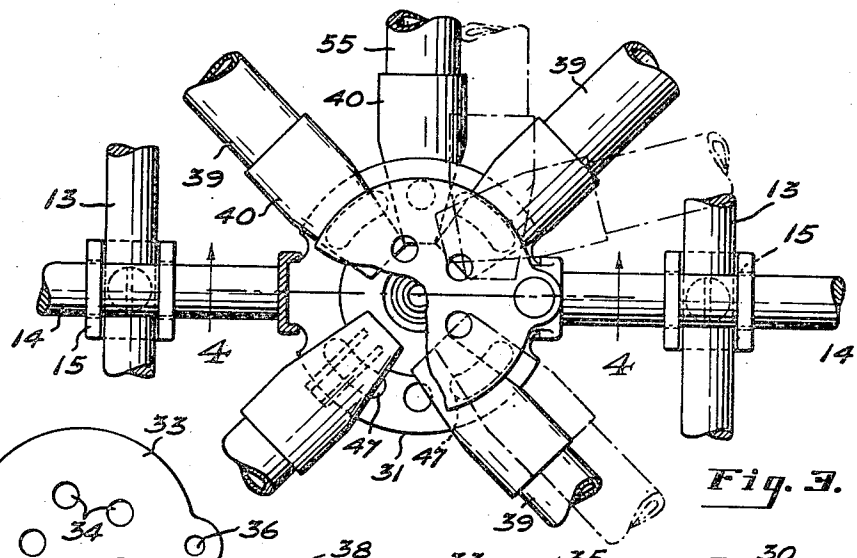


Fig. 3.

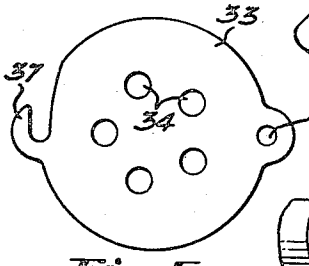
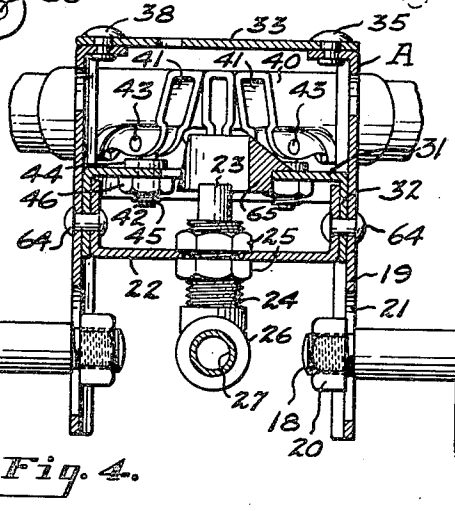


Fig. 5.



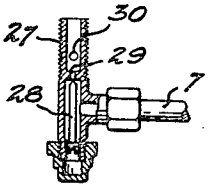


Fig. 6.

Fig. 4.

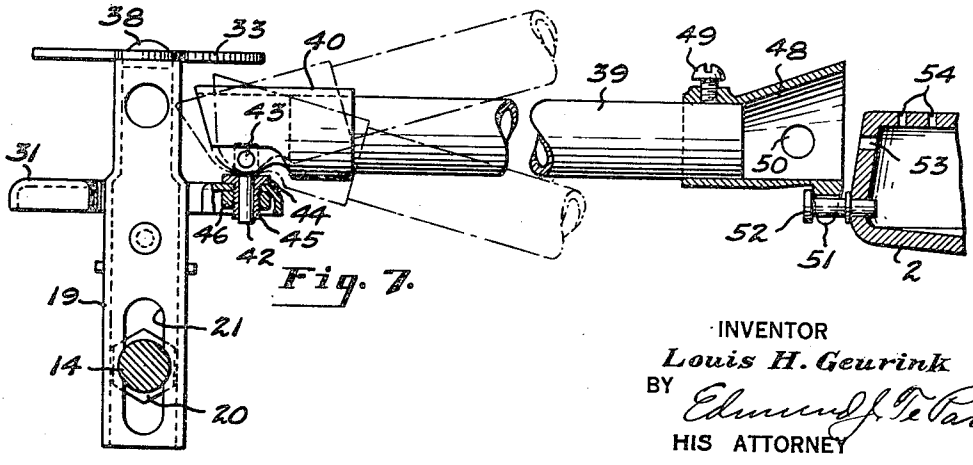


Fig. 7.

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UNITED STATES PATENT OFFICE

2,068,542

GAS RANGE BURNER IGNITION DEVICE

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Application October 13, 1931, Serial No. 568,559

19 Claims. (Cl. 158—115)

This invention relates to an ignition device for the burners of a gas range.

One of the objects of this invention is to provide in a device of the type described, a generally simplified flash lighter which is arranged to quickly and positively ignite the burners of a gas stove when gas is supplied to such burners.

Another object of this invention is to provide an adjustable flash lighter which is arranged so that it may be readily applied to various types of gas stoves without necessitating the changing of the stove in any way.

Another object of this invention is to provide a relatively inexpensive and easily manufactured lighter being formed from metal stampings so that it is readily adapted for manufacture by modern high speed factory production methods.

Another object of this invention is to provide a flash lighter having extensible flash tubes which are arranged to permit the ready removal of stove burners for cleaning and other purposes.

A further object of this invention is to provide a generally simplified support for a lighting device of the type disclosed whereby the lighter may be readily adjusted to a plurality of positions in any direction.

With these and other objects in view, the invention consists in the novel construction, arrangement and combination of parts, hereinafter described, illustrated in some of its embodiments in the accompanying drawings and particularly pointed out in the appended claims.

In the drawings, Figure 1 is a plan view of a gas range illustrating my improved lighter. Figure 2 is an enlarged sectional view taken on line 2—2, Figure 1. Figure 3 is an enlarged plan view of the central portion of my improved lighter. Figure 4 is an enlarged sectional view taken on line 4—4, Figure 3. Figure 5 is an enlarged plan view of the top shield plate of the lighter. Figure 6 is a central sectional view of the pilot burner mixing valve, and Figure 7 is an enlarged side elevational view partly in section illustrating the relation between one of the stove burners and its associated lighter tube.

Figure 1 of the drawings shows the top burner assembly of a conventional gas range 1, in which there is provided a plurality of top burners 2 arranged to be supplied with gas by way of a fuel supply conduit 3. The fuel supply conduit 3 communicates with a manifold 4 from which the gas supply of the top burners of the stove is controlled by the manually operable gas valves 5. The manually operable valve 6 is provided to control the operation and fuel supply of the burner 10 which is located in the oven 9.

The ignition of the heating burners of the stove is automatically effected by means of a flash lighter A which is centrally located with respect to the top burners 2 of the stove. This lighter is provided with a continuously operating pilot burner 23 arranged to be supplied with gas from the manifold 4 by way of the conduit 7 and its gas supply may be regulated by means of the manually operable valve 8.

The oven 9 is provided with an oven regulator or a thermostatic valve 11, which automatically maintains the temperature of the oven at a predetermined point as determined by the position of its adjustment handle 12.

The top burners 2 of the stove are carried on burner supporting rods 13. The rods 13 are further utilized in supporting the lighter A which is carried on a pair of aligned rods 14. The rods 14 in turn are carried in U-shaped stamped metal supporting members or clamps 15, which members are arranged to permit lateral and longitudinal adjustment of the lighter supporting rods 14 with respect to the burner supporting rods 13.

Upon the locating of the lighter A in the desired position, the device is locked in such position by means of the set screws 16 which are received in a pierced hole provided at the base of the U-shaped member. The set screw 16 is threadably received in a nut 17 which engages the base of the clamp 15. By this arrangement, the rods 13 and 14 are rigidly and adjustably clamped together providing a simple and inexpensive arrangement for securing the lighter in any desired position within the limits of its adjustability.

The lighter supporting rods 14 are threaded at their inner ends 18 for adjustably supporting the stamped metal side members 19 of the lighter. The members 19 are each provided with a slot 21 through which the reduced and threaded end 18 of the rod extends. A nut 20 is provided for clamping the member 19 against the shoulder of the rod 14. By reason of this arrangement, the lighter may be vertically adjusted with respect to its supporting rods 14. The side members 19 of the lighter are secured to each other by means of the cross members 22 and 31 which are secured to the side members by rivets 64.

The cross member 22 is provided with a central aperture for the vertically adjustable reception of the pilot burner 23. The pilot burner is provided with a threaded portion 24 for the reception of a pair of lock nuts 25, by means of which the

pilot burner may be vertically adjusted to a plurality of positions, so that it may be used with various kinds of commercial gases, the flame length of which varies with the B. t. u. value. The threaded portion 24 of the pilot burner forms a part of the L-shaped fitting 26 which fitting is arranged for communication with a T-shaped fitting 27 which forms the body of a needle adjusted gas and air mixing valve. The valve body 27 is provided with a needle adjusting valve 28, which controls the flow of gas through an injection port 29. This port is located behind a pair of air inlet openings 30 which are provided for the entrainment of air along with the gas issuing from the port 29, whereby a combustible mixture of gas and air is supplied to the pilot 23 so that it burns with a blue flame.

Immediately above the pilot supporting cross member 22, there is provided an annular stamped metal ring or centrally apertured disk 31, having a pair of downwardly extending tongues 32 which project between the upwardly projecting portions of the cross members 22 and the side members 19. In this manner the members 19, 22 and 31 are secured to each other by means of the rivets 64, and the complete assembly of this portion of the lighter is accomplished by means of the two rivets 64.

The members 19, 22 and 31 are all formed from sheet metal stampings which are of simple and inexpensive construction. The assembly of this portion of the lighter is completed by the installation of the perforated top shield member 33. The shield 33 is arranged to be rotatably secured to one of the lighter side members 19 by means of the rivet 35 which extends through a hole 36 in the shield. The shield 33 is provided with a slotted ear 37 which is arranged to engage the rivet 38 when the shield is in its closed position. By this arrangement, the top shield 33 may be rotated about the rivet 35, the purpose of which is to permit the installation or removal of the lighter flash tubes 39.

The flash tubes 39 of the lighter are received in stamped metal nozzle members 40 which members are provided with relatively restricted outlet openings 41, which openings are arranged to terminate just above and to one side about the pilot burner 23. The flash tube nozzles 40 are provided with downwardly extending supporting pins 42, which are pivotally secured to the nozzles by means of the rivets 43. The pins 42 are carried in a centrally bored bushing 44 having a downwardly extending threaded portion 45. This portion of the bushing 44 extends through the annular slots 47 formed in the ring 31. The threaded portion 45 of the bushing 44 is provided with a locknut 46 which provides a means for securing the bushing in the desired position in the slot 47.

By reason of the arrangement just discussed, the flash tubes 39 are supported at their inner ends so as to have a limited universal movement sufficient to permit the portion of the tube adjacent the main burner to be raised and shifted out of the way so that any one of the burners may be readily removed from the stove. In this specification the term universal is used to denote the pivoted connection between the flash tube end and the lighter housing, whereby the tube may be moved in any direction about such pivot with respect to the lighter housing. The ends of the flash tubes 39 adjacent the top burners 2 are provided with a slidable mouth piece 48 which adjustably receives the flash tube 39. The mouth pieces 48 are provided with locking screws 49 for their securement to their associated flash tubes.

The mouth piece 48 is upwardly flared at its outer end and is provided with a pair of ports 50 adjacent thereto. The underside of the mouth piece 48 is provided with a slotted and downwardly projecting lug 51 for the detachable reception of a pin 52 carried by the top burner 2. In this manner, each of the flash tubes 39 may be readily and quickly secured in operative position with respect to the top burners 2 which they are associated with.

Immediately above the pin 52, there is provided a lateral port 53 in the burner 2 which is arranged to inject gas into the flared opening of the mouth piece 48. The injector port 53 is closely adjacent to one of the customary burner ports 54. The mouth piece 48, by reason of its shape, constitutes a gas and air mixing tube of the Bunsen type. The side openings 50 also facilitate the entrainment of air into the mixing tube 39 when gas is issuing from the burner port 53. By reason of this arrangement, the tube 39 is supplied with a combustible mixture of gas and air which is readily ignitable by the pilot burner 23.

The upwardly flared portion of the mouth piece 48 facilitates in the collection of gas issuing from the port 52, aids in igniting the burner 2 by spreading the flame generated in the flash tube over the face of the burner 2 and by reason of its shape permits room for the complete combustion of the gas which is burning at the port 53.

It has been found in the use of the conventional flash-tube lighter under certain conditions, such as when natural gas is used that a flame will not travel or flash from the pilot to the burner 2 when gas is supplied to the burner 2. Under such conditions, a flame is maintained at the flash tube nozzle 40, the reason being, it is assumed, that there is not a sufficient amount of air accompanying or mixed in the gas which is conducted through the tube 39 to permit the progression of a flame in the flash tube backwardly to the ports 53 and 54 of the burner. My improved flash-tube mouth piece has overcome this difficulty as its construction insures the provision of a highly combustible mixture of gas and air to the pilot burner when gas is supplied to any of the top burners 2.

Under ordinary operating conditions when gas is supplied to any one of the burners 2, the gas injected by way of the port 53, to the flash tube 39, issues from the open end 41 of the nozzle 40 of the flash tube. This gas is then ignited by the flame of the pilot burner 23 and its flame travels backwardly through the tube and flashes out across the face of the main burner to effect its ignition. A centrally bored pilot flame guard 65 having a frusto-conical outer surface is removably carried on the ring 31 for the purpose of steadying the operation of the pilot burner.

The force of the slight explosion in the flash tube 39 does not affect the operation of the pilot burner 23 by reason of the fact that the flame of this pilot is not enclosed in any manner as has heretofore been the customary arrangement for lighters of this type. In this way, gases issuing from the tube 39 simply blow across the pilot 23 at some point above its flame and their force is rapidly dissipated. This is an important feature of my improved lighter and it greatly lessens the possibility of the extinguishment of the pilot burner upon the operation of the lighter. Heretofore, it has been considered essential to locate the pilot burner in a cup or housing in

order to insure the ignition of the various burners which are lighted thereby.

Improved ignition is obtained by reason of the adjustable arrangement provided for the flash tube nozzles 41 by the annular slots 47 whereby each nozzle may be located so that the combustible mixture from such nozzle issues at a point directly above the flame of the pilot burner 23, thereby insuring at all times a quick and positive ignition of the burner which is injecting gas into its associated flash tube.

The flash tubes 39 are pivotally movable in a vertical plane about the bearing provided by the rivet 43, as illustrated by the dotted line positions of the flash tube shown in Figure 7. The pin 42 and its associated bushing 44 provides a means for swinging the flash tubes in a horizontal plane about such pin as illustrated by the two dotted line positions shown in connection with one of the tubes of Figure 3.

The circumferential adjustment of the flash tube nozzles 40 about the pilot burner provided by the annular slots 47, is illustrated by the dotted line position shown in connection with one of the flash tubes of Figure 3. The flash tubes may be bodily removed from the lighter by simply swinging the shield plate 33 away from above the nozzles 40, whereupon the tubes and their associated pins 42 may be withdrawn from the bushings 44.

The ignition of the oven burner is effected by way of a flash tube 55, the outer end of which is removably received in the outer end of the tube 56, the other end of the tube 56 is located adjacent to a port 62 formed in the oven burner. The end of the tube 56 and the oven burner 10 are maintained in proper relation with respect to each other by means of pins or lugs 59 carried on the outer end of the tube 56 which engage the supporting lugs 60 carried by the oven burner. The tube 56 is provided with a collar 57 whereby it is secured to the oven wall by screws or bolts 58. The port 62 is arranged to inject gas into the tube 56 whereby a flash is generated in such tube for effecting ignition of the gas issuing from the oven burner ports 63 when gas is supplied thereto. The end of the tube 56 adjacent the burner 10 is provided with a pair of side openings 61 which are provided to insure the entrainment of a sufficient amount of air with the gas conducted to the pilot 23.

From the foregoing, it is apparent, that I have provided a relatively simple and inexpensive lighting device for gas stoves which is arranged to effect the positive and substantially instantaneous ignition of all of the burners of a gas range and which possesses adjustable features permitting its application without change to various and structurally different gas ranges.

Furthermore, it is to be understood that the particular forms of apparatus shown and described, and the particular procedure set forth, are presented for purposes of explanation and illustration and that various modifications of said apparatus and procedure can be made without departing from my invention as defined in the appended claims.

Having thus described my invention, what I claim is:

1. In a flash lighter for gas burning appliances, in combination, a source of gaseous fuel supply, a continuously operating pilot burner, a main burner located outside the range of normal lighting proximity with respect to said pilot burner and having ports for the emission of the fuel supplied to said main burner, an open-ended gas conducting flash tube extending from said main burner to said pilot burner for conducting gas from said main burner to the flame of said pilot for effecting the ignition of said main burner when gas is supplied thereto, means pivotally secured to said flash tube and engageable with said pilot burner at a plane different to that of the pivot on the flash tube, said means providing a readily detachable universal joint connection between the end of said flash tube and said pilot burner, a readily displaceable member carried by said pilot burner and normally preventing the disengagement of said flash tube pivot means from said pilot burner, and means for supporting the other end of said flash tube on said main burner.

2. A flash-tube gas burner lighter comprising, a continuously operating pilot burner, a main burner ignitable thereby, and a flash tube extending substantially horizontally between said burners having a relatively restricted open end adjacent to said pilot burner and a relatively enlarged upwardly extending open end adjacent said main burner and disposed to provide a substantially horizontally disposed mouth, said main burner being arranged to inject gas substantially horizontally into the mouth of said flash tube for effecting its ignition by said pilot burner when said main burner is supplied with gas.

3. A supporting structure for a flash-tube lighter having a plurality of flash tubes and a continuously operating pilot burner comprising, stamped metal side members, and a pair of stamped metal cross members secured thereto, one of said cross members serving as a support for said pilot burner and the other of said cross members serving as a support for said flash tubes.

4. A supporting structure for a flash-tube lighter having a plurality of flash tubes and a continuously operating pilot burner comprising stamped metal side members, a perforated shield plate carried on the top of said members, and a pair of stamped metal cross members secured thereto, one of said cross members serving as a support for said pilot burner and the other of said cross members serving as a support for said flash tubes.

5. A supporting structure for a flash-tube lighter having a plurality of flash tubes and a continuously operating pilot burner comprising, stamped metal side members, a pair of stamped metal cross members, and a single rivet for securing each of said side members to said cross members, one of said cross members serving as a support for said pilot burner and the other of said cross members serving as a support for said flash tubes.

6. A supporting structure for a flash-tube lighter having a plurality of flash tubes and a continuously operating pilot burner comprising, a pair of oppositely disposed stamped metal channeled side members, a pair of stamped metal cross members having vertically disposed end portions, and means for securing the end portions of said cross members to said side members, one of said cross members serving as a support for said pilot burner and the other of said cross members serving as a support for said flash tubes.

7. In an ignition system for a gas burning appliance having a plurality of main burners, in combination, a continuously operating pilot burner, a plurality of main burners ignitable thereby, a source of gaseous fuel supply therefor, a supporting member for said pilot burner, adjustable supporting means for said member whereby it

may be shifted with respect to said main burners, a gas conducting flash tube for each of said main burners having a swiveled connection at one end with said member, and means carried by each of said main burners for detachably supporting one of said flash tubes thereon whereby the said flash tubes may be detached from the main burners and swung to one side to permit the removal or cleaning of the main burners, such operation being effected without disturbing the swiveled connection of said flash tubes.

8. In an ignition system for a gas burning appliance having a plurality of main burners, in combination, a continuously operating pilot burner, a plurality of main burners ignitable thereby, a source of gaseous fuel supply therefor, a gas conducting flash tube connected to each of said main burners and extending to a point adjacent said pilot burner for effecting the ignition of said main burners when supplied with gas, means for supporting one end of such flash tubes above said pilot burner, said tubes being of relatively large diameter and being tapered to provide a restriction therein at the end adjacent to said pilot burner, and means for connecting said flash tubes to said supporting means arranged to permit their circumferential adjustment around said pilot burner.

9. In a gas burning appliance, in combination, a plurality of main burners having flame supporting ports and a lighter injector port formed in each of said burners, a continuously operating pilot burner, a gas conducting flash tube for each of said main burners having one end adjacent the injector port of said main burner and the other end adjacent the flame of said pilot burner, a supporting member for the ends of said tubes adjacent said pilot burner, a pin pivotally secured to one end of each of said flash tubes, and socket members carried by said supporting member for receiving said pins.

10. In a gas burning appliance, in combination, a plurality of main burners having flame supporting ports and a lighter injector port formed in each of said burners, a continuously operating pilot burner, a gas conducting flash tube for each of said main burners having one end adjacent the injector port of said main burner and the other end adjacent the flame of said pilot burner, a supporting member for the ends of said tubes adjacent said pilot burner, a pin pivotally secured to one end of each of said flash tubes, socket members carried by said supporting member for removably receiving said pins, and a cover plate removably carried by said supporting member above the ends of said flash tubes.

11. In a gas burning appliance, in combination, a plurality of main burners having flame supporting ports and a lighter injector port formed in each of said burners, a continuously operating pilot burner, a gas conducting flash tube for each of said main burners having one end adjacent the injector port of said main burner and the other end adjacent the flame of said pilot burner, a supporting member for the ends of said tubes adjacent said pilot burner, a pin pivotally secured to one end of each of said flash tubes, and socket members adjustably carried by said supporting members for receiving said pins and for adjusting the position of said flash tube so that its axis substantially intersects the flame of said pilot burner.

12. In a gas burning appliance, in combination, a plurality of main burners, a source of gas supply therefor, a continuously operating pilot burner, a flash tube for each of said main burners for conducting gas therefrom to the flame of said pilot burner for effecting the ignition of said main burners when supplied with gas, a vertically adjustable support for the ends of said flash tubes adjacent said pilot burner, and means for adjustably securing said pilot burner to said support.

13. In a gas burning appliance, in combination, a plurality of main burners, a source of gas supply therefor, a continuously operating pilot burner, a flash tube for each of said main burners for conducting gas therefrom to the flame of said pilot burner for effecting the ignition of said main burners when supplied with gas, a laterally and vertically adjustable support for the ends of said flash tubes adjacent said pilot burner, and means for adjustably securing said pilot burner to said support.

14. In a gas burning appliance, in combination, a plurality of main burners, a source of gas supply therefor, gas control valves for said burners, rods for supporting said burners, a continuously operating pilot burner, a flash tube for each of said main burners for conducting gas therefrom to the flame of said pilot burner for effecting the ignition of said main burners when supplied with gas, a vertically adjustable support for the ends of said flash tubes adjacent said pilot burner, and means for adjustably securing said support to said burner supporting rods whereby said support may be laterally shifted with respect to said main burners.

15. In a gas burning appliance, in combination, a plurality of main burners, a source of gas supply therefor, gas control valves for said burners, rods for supporting said burners, a continuously operating pilot burner, an axially-extensible flash tube for each of said main burners having one of its open ends secured to an associated main burner in gas receiving relation to a port formed in such main burner and having its opposite open end terminating at a point adjacent to the flame of said pilot burner, a vertically adjustable support for the ends of said flash tubes adjacent said pilot burner, adjustable means for securing said flash tubes to said support and for effecting circumferential adjustments of said flash tubes about said pilot burner, and means for adjustably securing said support to said burner supporting rods whereby said support may be laterally shifted with respect to said main burners.

16. In a flash lighter, the combination of a pilot burner member; a flash tube member; means for connecting the end of said flash tube to said pilot burner for universal movement therewith, said means comprising a projection on one of said members engageable in an apertured portion of said other member, said projection providing for rotatable movement between said flash tube and pilot burner in one plane and for movement of said tube in another plane with respect to said projection, said means permitting the ready removal of said flash tube from said pilot burner; and a readily displaceable member carried by said pilot burner member in position to normally restrict the disengagement of said flash tube from said pilot burner member.

17. A flash tube lighter for a plurality of gas burners comprising, a plurality of gas conducting flash tubes associated therewith, a continuously operating pilot burner, a member supporting said pilot burner, a plate carried by said member at a plane above said pilot burner and surrounding the latter, and means on the top of said plate and on the pilot end of each of said tubes providing a

pivotal connection for said tubes with said plate, said tubes being readily detachable from said plate by a movement at right angles to said plate top.

18. A flash tube lighter for a plurality of gas burners comprising, a plurality of gas conducting flash tubes associated therewith, a continuously operating pilot burner, a member supporting said pilot burner, a plate carried by said member at a plane above said pilot burner and surrounding the latter, and means on the top of said plate and on the pilot end of each of said tubes providing a pivotal connection for said tubes with said plate, said tubes being readily detachable from said plate by a movement at right angles to said plate top, and a readily displaceable plate carried by said member above said first plate and parallel thereto, said displaceable plate normally restricting the movement of said pivotal ends of the flash tubes to prevent the disengagement thereof from the pilot burner member.

19. In a gas burning appliance, in combination, a plurality of main burners, a source of gas supply therefor, a continuously operating pilot burner, a flash tube for each of said main burners for conducting gas therefrom to the plane of said pilot burner for effecting ignition of said main burners when supplied with gas, a laterally extended plate surrounding said pilot burner and having a plurality of spaced perforations therein, means on the pilot burner ends of said flash tubes engageable in said plate perforations to detachably mount said flash tubes adjacent said pilot burner, and cover plate positioned above and parallel to said first plate and overlying said flash tube ends to prevent disconnection of the latter.

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