June 1, 1926.

1,586,813

O. J. LEINS

FLASH IGNITER

Filed Dec. 12, 1923

Fig. 1.

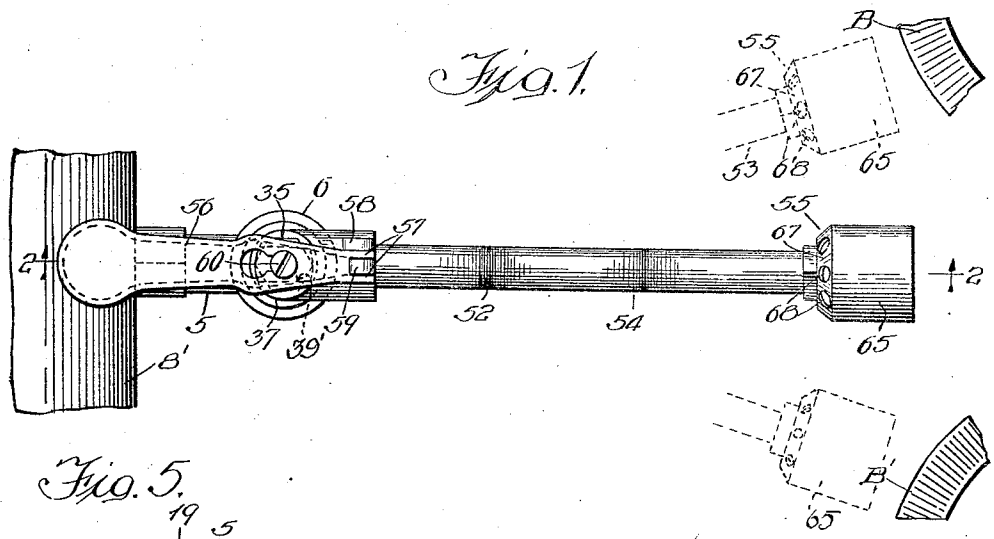


Fig. 5.

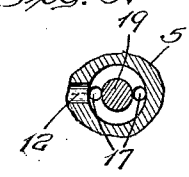


Fig. 2.

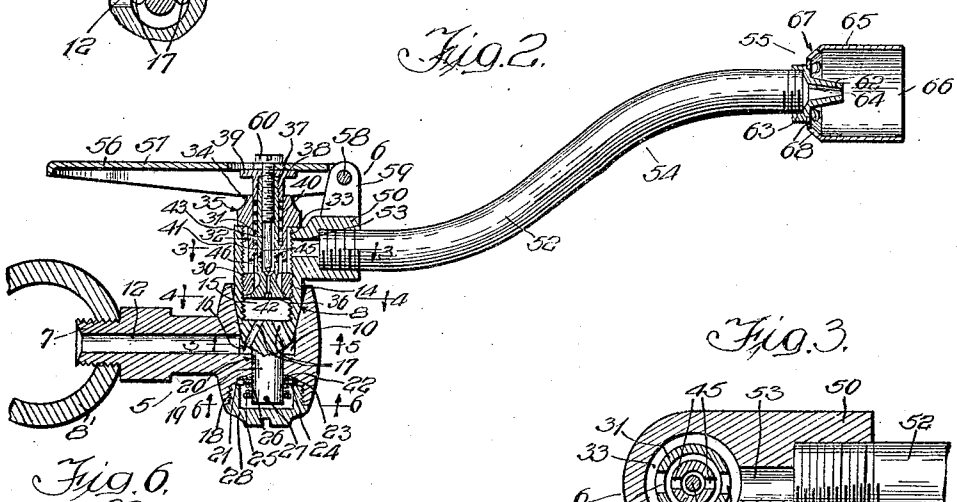


Fig. 3.

Fig. 6.

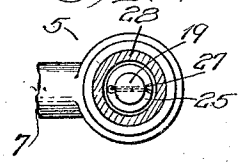
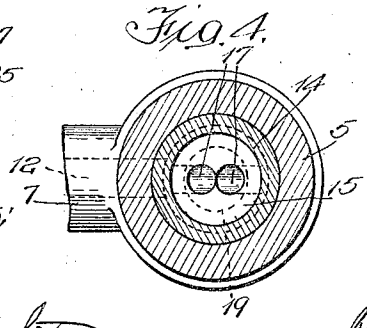


Fig. 4.



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UNITED STATES PATENT OFFICE.

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FLASH IGNITER.

Application filed December 12, 1923. Serial No. 680,185.

This invention relates to flash igniters for gas burners and the like, and more particularly to flash igniters of the "single flash" type, in which a single flame is employed for selectively igniting any of a series of burners.

In lighting devices or igniters of this sort considerable difficulty has been encountered in preventing leakage, especially at the joint which permits movement of the lighter to selectively direct the single pilot or flame toward the desired burner. Ground joints have been provided in which a relatively stationary and a relatively movable member are employed, one with a conical bore and the other with a conical surface seated in said bore, but in leading the gas or other fuel past such a joint, the prior art devices interrupt the continuity of the conical bore or of the conical surface seated therein, or both. The interruption of either or both said surfaces, interrupts the continuity of cooperation therebetween, and in the operation of the device the relative movement between the parts produces uneven wear in said surfaces. This impairs the tightness of the joint and leakage results.

One object of my invention is to prevent this leakage and to provide a joint which will wear uniformly and seat tightly at all times.

Another object is to improve and simplify the construction of devices of this sort and to provide a device having a minimum number of parts which may be manufactured and assembled at a minimum cost and which may be conveniently taken apart for cleaning and repair.

Another object is the provision of a novel and simplified igniter jet and shielding hood therefor.

Another object is the provision of a device which is not dependent upon returning it to a neutral or "off" position to decrease the igniting flame from its "projected lighting" to its "normal pilot" condition and the provision of novel and improved means for selectively directing the igniter to the desired point and for projecting the flame to the selected point.

To the end of simplifying and improving the construction and minimizing the number of parts, common means is preferably provided for shifting the device selectively to different positions and for projecting the flame. In projecting the flame the movement of the fuel increasing means is in the direction of the seating movement between the relatively movable parts of the device. Common means is provided for regulating the restricted or "normal pilot" position of the igniter flame and for securing the flame projecting means in operative position. One end of the member having the conical bore is closed against the entrance of dust and dirt, and enclosed within said member is means for holding the other member seated therein and for automatically taking up the wear between the parts.

Other features not already set forth will appear from the following detailed description and the claims taken with an inspection of the accompanying drawings in which:—

Fig. 1 is a top plan view of an igniter embodying the present invention, illustrating diagrammatically its disposition with respect to the burners of a stove;

Fig. 2 is a longitudinal detailed section on line 2—2 of Fig. 1;

Fig. 3 is an enlarged detailed section on line 3—3 of Fig. 2;

Fig. 4 is an enlarged detail section on line 4—4 of Fig. 2;

Fig. 5 is a detailed section on line 5—5 of Fig. 2; and

Fig. 6 is a detailed section on line 6—6 of Fig. 2.

Referring to the drawings, 5 designates the relatively stationary and 6 the relatively movable part of the igniter. Although the present invention is not limited to embodiment in the valve of the igniter, part 5 is shown in the form of a valve shell having a threaded nipple 7 to be threaded or tapped into and rigidly secured in a fuel supply pipe 8′ which may be the gas supply pipe to the stove, for example. Shell 5 is provided with a vertically disposed bore preferably tapered conically at 8 down to the upper end of a cylindrical well 10 which continues from the lower end of the conical portion of the bore. A passage or duct 12 leads through nipple or extension 7 and opens at its inner end into well 10.

The relatively movable part 6 has a tapered plug 14 rotatably seated in the conical seating portion 8 of the vertically disposed bore in shell 5, the cooperating conical exterior of plug 14 and the conical surface 8 forming a ground joint which

permits rotation of part 6 relative to part 5 and at the same time provides a tight joint between said parts. Rotatable member 6 is provided with an internally threaded bore forming a chamber 15, and below the conical exterior of plug 14 said member is tapered abruptly at 16. Ducts 17 open through the abruptly tapered portion 16 into chamber 15 thereby placing said chamber 15 in communication with well 10.

The lower end of shell 5 is bored out and internally threaded at 18 and the lower end of member 6 has an integral stem 19 which projects through an opening 20 and down into said bored out lower end of shell 5. Surrounding the projecting end of stem 19 and seated in a recess 21 and upon an inclined surface 22 is a fiber washer 23 and seated upon said fiber washer is a metallic ring or washer 24, between which and a similar ring or washer 25 a coiled spring 26 is interposed A removable cotter pin 27 secured in the lower end of stem 19 and projecting diametrically therefrom prevents downward displacement of washer 25. Spring 26 holds the tapered seating surface of plug 14 firmly seated in the tapered bore 8 and automatically takes up the wear between the cooperating tapered surfaces, and it also holds washer 23 firmly seated to provide a tight joint at the lower end of stem 19. A cap 28 provided with a screw driver slot 29 is threaded into and closes bore 18, dust and dirt being thereby excluded from said bore and the means for maintaining the conical plug seated being enclosed and locked in position.

The disposition of ducts 17 below the conical seating surface of plug 14 disposes the entrance of ducts 17 into well 10 below the conical bore of shell 5 and permits leading the gas or other fuel past the ground joint between the tapered exterior of plug 14 and the conical seating surface in shell 5 without interrupting the continuity of the cooperating conical surfaces. The result is that in the relative movement between parts 5 and 6 the cooperating conical surfaces wear uniformly and remain tight and properly seated. There are no interruptions, ports or openings in either of said surfaces, such as have heretofore produced ridges and uneven wear in the cooperating conical surfaces in the action of the igniter with a resulting impairment of the tightness of the joints. Well 10 may be of cylindrical formation as shown, or it may be flared outwardly toward its lower end, the essential feature being that the portion of the bore interrupted by duct 12 does not form part of the seating surface for the conical plug 14 and surface 16 through which ducts 17 extend does not cooperate with the shell in seating the plug.

To the end of producing uniform wear between the external conical surface of plug 14 and the cooperating internal conical surface 8 to maintain the joint tight after use, the conical socket 8 extends up above the upper end of the cooperating conical surface of plug 14 and the cooperating conical surface of the plug extends down below the conical socket 8 as shown in Fig. 2. The result of this is that in the action of the valve, the conical seating surface of plug 14 extending below socket 8, there are no circumferential ridges produced in socket 8 in the direction of the seating movement of plug 14 such as would be produced with the accompanying impairment of the tightness of the joint, if the plug terminated short of the lower end of surface 8. The extension of conical surface 8 above the cooperating conical surface of plug 14 similarly avoids ridges in the conical surface of the plug, such as would be formed in the conical seating surface of the plug if said surface extended above the conical socket 8.

Threaded into bore 15 at 30 is a plunger cage 31 reduced at 32 to form an annular passage 33 and provided at its upper end with a head 34 formed non-circular at 35 for engagement by a wrench or other suitable tool The lower end of cage 31 forms a valve seat engageable by the head 36 of a plunger valve 37 whose stem 38 extends upwardly through the cage and carries button or head 39 threaded thereon. Head 36 is normally urged to closed position by a spring 40 disposed within the upper portion of cage 31 and bearing at one end against button 39 and at its opposite end against a shoulder 41 within cage 31.

A passage or duct 42 through valve head 36 opens into a bore 43 in stem 37 and constitutes a by-pass through which a restricted flow of fuel is permitted when head 36 is seated. Above head 36 diametrical ports 45 open out from bore 43 into the interior of cage 31 which opens out through ports 46 into annular space 33. Above its conical seating surface plug member 14 has a projecting boss 50 into which one end of a tube 52 is threaded. A duct 53 leads from annular passage 33 through boss 50 and opens into tube 52, said tube being turned up at 54 and carries at its opposite end a firing head 55.

A lever arm 56 having down turned flanges 57 fulcrumed at their forward ends at 58 on a lug or ear 59 projecting up from boss 50 rests upon button 39 with its down turned flanges depending into cooperation with opposite flat sides or edges 39′ of the button and holding the button against rotation when arm 56 is in cooperation therewith. A pin 60 binds lever 56 and button 39 together. Pin 60 constitutes a valve pin. It is threaded through button 39 and into stem 38, and its lower end is tapered and co-

operates with the upper end of duct 42 so that by threading the pin in or out the normal restricted flow of fuel to the firing head may be regulated.

The firing head 55 includes a tip or jet 62 enlarged at its inner end and threaded at 63 upon the outer end of tube 52. Jet 62 has a single tapered outlet 64 from which a small light normally issues, and by increasing the fuel supply to the firing head or jet a long jet of flame is projected. A hood 65 surrounds jet 62 and protects the pilot light from being extinguished by currents of air and from any dead gases from the stove burners, for example. Hood 65 is of cylindrical formation having an open end 66 and tapered at 67 to a radially extending portion welded or otherwise secured to jet 62 or formed integral therewith. A plurality of air inlet openings 68 through the tapered portion 67 of hood 65 admit air for proper combustion of the fuel issuing from jet 62. The oblique disposition of these openings 68 directs the air supply along the axis of jet 62 just forward of the discharge end of the jet and within hood 65. This assures proper maintenance of the small or singly burning pilot light and also proper combustion of the projected stream without distorting the same and the disposition of openings 68 in the tapered portion of the hood permits a maximum size of said openings relative the diameter of the hood. The hood and jet are removed and replaced upon tube 52 as a unit.

In operation a small pilot light is normally maintained at jet 62 by the passage of fuel from pipe 8 through duct 12, well 10, ducts 17, chamber 15, duct 42, the interior of stem 48, ports 45, cage 31, ports 46, space 33, duct 53 and the tube 52 to jet 62. The size of the normal pilot light may be adjusted by turning screw 60. To light either of the burners B or B' finger piece or arm 56 is grasped and the movable or rotatable part of the igniter is turned selectively into either of the dotted line positions shown or any other position in its range of movement to direct tip 62 toward the burner to be lighted. Lever 56 is then depressed to unseat valve head 36, whereupon the fuel supplied to the firing head is directly through the open end of valve cage 31. This increases the supply and projects a long slender jet of flame to the burner for igniting the same. In increasing the fuel supply to project the flame, the movement of the plunger valve is in the direction of the seating of plug 14 on surface 8. Play or looseness between the parts after use is thereby minimized. The single screw 60 regulates the normal pilot flame and holds lever 56 securely in place. The lower end of shell 5 and the means for holding the plug seated are all enclosed. The device is not dependent upon returning to an "off" or neutral position to decrease the flame to its normal pilot condition. As soon as finger piece 56 is released, spring 40 returns valve head 36 to its normal condition.

From the foregoing, it will now be apparent that the number of parts is minimized and that the parts are simple and easily assembled and dismantled for cleaning and repair. Removal of cap 28 permits access to pin 27 and removal of said pin permits separation of parts 5 and 6. Removal of screw 60 permits arm 56 to be swung out of the way and cage 31 may then be readily unscrewed from part 6. Unthreading of button 39 permits separation of valve 37 from cage 31.

While I have described the invention in connection with the details of a particular embodiment, the invention is not limited to such details, nor is it limited to embodiment in the valve mechanism of the igniter. The fuel may be led past the ground joint without interrupting the continuity thereof in manners other than the particular one shown.

I claim:—

1. In a device of the class described, the combination of a valve casing connected with a source of fuel, a plug rotatably mounted therein, a supply tube carried by and communicating with said plug, an uninterrupted conical seat in said casing, an uninterrupted conical seating surface on said plug and co-acting with said seat, and means for conveying fuel from said casing into said plug without interrupting the continuity of the co-acting portions of said seat and seating surface.

2. In a device of the class described, the combination of a valve casing connected with a source of fuel, a plug rotatably mounted therein, an uninterrupted conical seat in said casing, an uninterrupted conical surface on said plug and co-acting with said seat, and means for conveying fuel from said casing into said plug and from the plug without interrupting the continuity of the co-acting portions of said seat and seating surface.

3. In a device of the class described the combination, of a pair of igniter members one adapted for movement relative the other, a continuous seat on one of said members, and a seating surface on the other member co-acting with and seated on said seat and means for conveying fuel from one of said members to the other with said last member seated on said seat and without interrupting the continuity of said seat.

4. In a device of the class described the combination, of a pair of igniter members one adapted for movement relative the other, a seat on one of said members, and a continuous seating surface on the other member co-acting with and seating on said

seat and means for conveying fuel from one of said members to the other with said last member seated on said seat and without interrupting the continuity of said seating surface.

5. In a device of the class described, the combination, of a pair of igniter members one adapted for movement relative the other, an uninterrupted seat on one of said members, an uninterrupted seating surface on the other member co-acting with and seated on said seat, and means for conveying fuel from one of said members to the other with said seating surface seated on said seat and without interrupting the continuity of said seat and seating surface.

6. In a device of the class described the combination, of a pair of igniter members one adapted for movement relative the other, a continuous ground joint between said members, and means for conveying fuel from one of said members to the other without interrupting the continuity of said joint.

7. In a device of the class described, an igniter member having a conical socket, a second igniter member having a conical surface having continuous cooperation with and rotatably seated in said socket, and means for conveying fuel from one of said members to the other with said second member seated in said socket and without interrupting the continuity of cooperation between said surface and said socket.

8. In a device of the class described, a valve casing member adapted for connection with a source of fuel supply and having an internal chamber and an internal conical seat, means for supplying fuel into said chamber outside said conical seat, a relatively movable valve member having a conical surface seated on the conical seat of said first member, and means for supplying fuel into said relatively movable valve member outside the conical seating surface thereof.

9. In a device of the class described, a valve casing member adapted for connection with a source of fuel supply, a conical socket in said member, a well below said socket, a duct opening from the source of supply into said well, a valve member rotatably mounted in said casing member and having a conical surface seated in said socket, port means opening from said well into said relatively movable valve member below the conical seating surface thereof, a tube leading from said relatively movable valve member, and a firing head on said tube.

10. In a device of the class described, a relatively stationary member for connection with a source of fuel supply, a second member rotatably seated on said first member, a firing head, means for supplying a restricted supply of fuel to said firing head, and common means for rotating said second member to shift the firing head to selective positions and for increasing the fuel supply to the firing head, said means acting in the direction of the seating movement of said second member on said first member in increasing the fuel supply to the firing head.

11. In a device of the class described, a relatively stationary valve member for connection with a source of fuel supply, said member having a conical seating surface, a movable valve member rotatably seated on said conical surface, a supply tube connected to said movable valve member, a firing head on said tube, means for supplying a restricted fuel supply to the firing head, common means for rotating the movable valve member to shift the firing head to selective positions and for increasing the fuel supply to the firing head, said means acting in the direction of the seating of the movable valve member on the conical seating surface of the relatively stationary valve member in increasing the fuel supply to the firing head, and common means for holding said first common means in operative position and for regulating the restricted fuel supply to the firing head.

12. In a device of the class described, a relatively stationary valve casing member having a conical socket, a relatively movable valve member having a conical plug seated in said socket, said relatively movable valve member having a valve seat, a valve member for co-action with said seat, said last valve member having a projecting stem, a by-pass through said last valve member, an arm pivoted to said second relatively movable valve member, and adapted for turning same in said relatively stationary valve casing member, and a valve pin securing said arm to the valve stem projecting from the relatively stationary valve casing member and adapted for regulating the fuel supply by way of said by-pass.

13. In a device of the class described, a valve casing member adapted for connection with a source of fuel supply, a relatively movable valve member seated in said casing and having a stem projecting into a recess in the opposite end of the valve casing member, means in said recess for holding the relatively movable valve member seated in said casing member and for taking up wear between said members, and a cap enclosing the projecting stem of said relatively movable valve member and the seating means co-operating therewith.

14. In an igniter, the combination with an igniter member having a conical socket, of a second igniter member having a conical surface seated in said socket, the conical surface of said second igniter member ex-

tending beyond said conical socket in the direction of the seating movement of said second member, and the conical socket extending beyond the opposite end of the conical surface of said second member.

15. In a device of the class described, a relatively stationary valve member for connection with a source of fuel supply, a relatively movable valve member rotatably seated therein, said relatively movable valve member having an internal valve seat, a valve member cooperable with said seat, said last valve member having a projecting stem, an arm pivoted to the relatively movable valve member and adapted for turning same in the relatively stationary valve member, said arm holding said projecting stem against rotation.

In witness whereof, I hereunto subscribe my name this 4th day of December, 1923.

OSCAR J. LEINS.