March 29, 1932. J. C. ROACH 1,851,263

SELF LIGHTING ACETYLENE TORCH

Filed Jan. 7, 1930

Fig. 1.

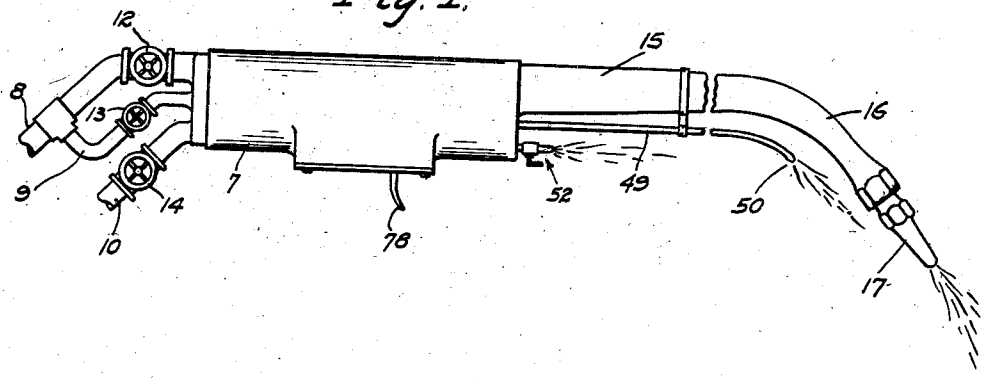


Fig. 2.

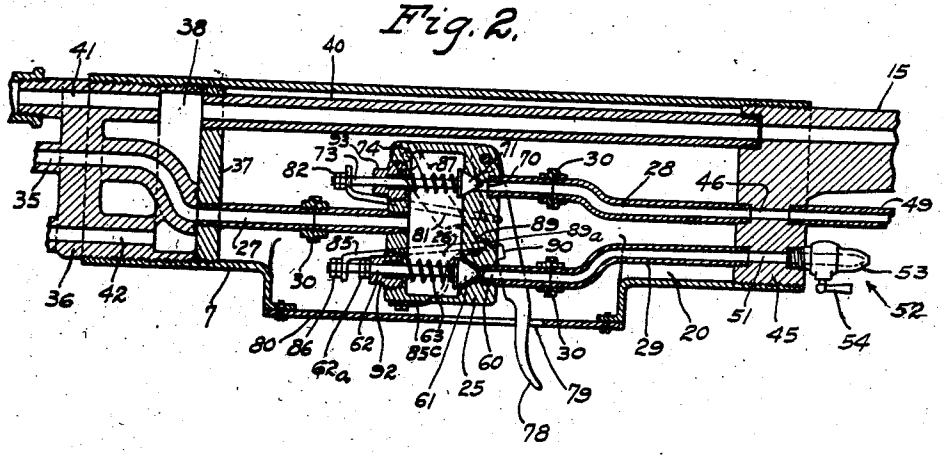


Fig. 3.

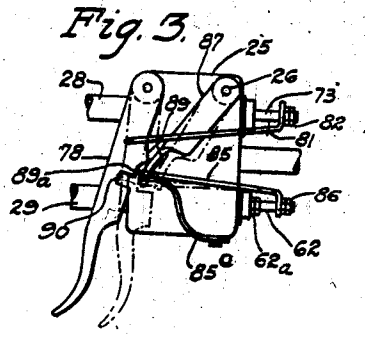
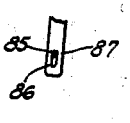


Fig. 4.



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UNITED STATES PATENT OFFICE

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SELF-LIGHTING ACETYLENE TORCH

Application filed January 7, 1930. Serial No. 419,078.

This invention relates to a pilot burner construction for blow torches, in general.

An object of the invention is to provide for blow torches and other heating appliances, a pilot burner construction that will enable the operator to control in a more satisfactory manner the operation of the pilot burner thereby rendering its action more positive and dependable.

Another object of the invention is to provide a pilot burner construction which will economize fuel. This latter feature of this invention is carried into effect by an arrangement for momentarily increasing the fuel supply to the pilot burner at the particular time when said pilot burner is to perform the igniting function.

The invention comprises not only a single pilot burner together with its operating means, but also such pilot burner in combination with another pilot burner adapted to transfer the flame provided by the first mentioned pilot burner to a point some distance in advance thereof, thus igniting the flame coming from the tip of the torch to which the invention is applied.

The invention further comprises the improved means for coordinating the action of the plurality of pilot burners employed in one of the embodiments thereof.

Other objects, advantages and features of invention may hereinafter appear.

Referring to the accompanying drawings which illustrates what is at present deemed to be a preferred embodiment of the invention,

Fig. 1 is a side elevation of an acetylene torch provided with the invention.

Fig. 2 is a longitudinal mid-section on a larger scale of the torch shown in Fig. 1 end portions of the torch shown in Fig. 1 being broken away to contract the view.

Fig. 3 is an elevation of the opposite side of the valve housing shown in Fig. 2.

Fig. 4 is a fragmental detail of one of the arms which controls the operation of the valve of the primary pilot burner.

Referring in detail to the drawings, the torch which is illustrated comprises a barrel 7 having a main fuel supply conduit 8, a pilot burner supply conduit 9 which branches off from said conduit 8 and an acetylene conduit 10. Said conduits 8, 9 and 10 are respectively provided with manually operable control valves 12, 13 and 14. At the other end of the barrel, the torch is provided with the burner tube 15 which leads to the tapered end portion 16, the latter terminating in a burner tip 17.

Within said barrel 7 is contained a chamber 20 within which is mounted the casing 25 of the pilot burner supply chamber 26. Said casing 25 is supported by the fuel supply pipe 27 at one side thereof and the fuel delivery pipes 28 and 29 at the other side thereof. Each of these fuel pipes are formed in separable sections which, when the housing 25 is in the operative position, are united by couplings 30, said couplings being provided to make is possible to assemble the parts conveniently. The pilot burner fuel supply pipe 9 communicates with the burner supply pipe 27 by means of a passage 35 formed within a casting 36 which is externally screw threaded and over which the adjacent internally threaded end portion of the barrel 7 is screwed. A head 37 is screwed into that end of the barrel 7 before said casting 36 is screwed into place, there being a mixing chamber 38 provided within said casting 36 the inner wall of which is formed by said head 37 when the parts are assembled. Said head 37 is provided with properly located internally threaded openings to receive the pilot burner fuel supply pipe 27 and to receive the main fuel supply conduit 40 which leads to the burner tube 15.

A passage 41 conducts gas from the supply conduit 8 to the upper portion of the mixing chamber 38 while a passage 42 conducts oxygen from the supply pipe 10 to the lower portion of said mixing chamber 38. At the other end of the barrel 7 a casting 45 is provided that is preferably integral with the burner tube 15 and which is provided with a passage 46 which conducts fuel from the tube 28 to a pilot burner tube 49 of a pilot burner 50.

Said casting 45 is also provided with a passage 51 which conducts fuel from the pipe 29 to the primary pilot burner 52, said burner

being provided with a burner tip 53 and a valve 54. The chamber 26 is provided with an outlet port 60 through which the fuel is supplied for the primary pilot burner 52. Said port 60 is controlled by a tapered valve 61 having an operating stem 62 which extends through and has a working fit within the opposite wall of the casing 25. Around said stem 62 is coiled a compression spring 63 which tends to seat said valve 61.

Above said port 60, port 70 also leads from the chamber 26, said port 70 furnishing fuel to the auxiliary pilot burner 50. Said port 70 is controlled by a conical valve 71 which is provided with a stem 73 that projects through the opposite wall of the casing 25 and has a working fit therein. Around said stem 73 is coiled a compression spring 74 which tends to hold said valve 71 in the closed position.

To the upper corner of said casing 25 at one side thereof is pivoted a valve operating lever 78 which projects downward through a slot 79 in a cover plate 80 with which the lower side of barrel 7 is provided. Said lever 78 is operatively connected with the valve stem 73 by means of a rod 81, the left end portion of which as seen in Fig. 2, is deflected in order that the outer end portion of the valve stem 73 may extend therethrough, said valve stem 73 having nuts 82 screwed thereonto to provide means whereby through the operation of lever 78 and rod 81 the valve 71 may be opened against the opposition of its spring 74.

The opening of the lower valve 61 against the opposition of its spring 63 is secured by the provision of an operating rod 85 having a deflected end portion through which extends the outer end of said valve stem 62, nuts 86 being provided on the end of said stem 62 against which said rod 85 abuts. The other end of said rod 85 passes loosely through slot 86 in the free end of a pendant link or guide arm 87, the upper end of which is attached to the housing 25 by means of a pivot pin 26. The valve operating lever 78 is provided with a cam portion 89 which is positioned to engage the lower portion of the pendant arm 87 in such a manner that when said lever 78 is moved from the full line position of Fig. 3 to the dotted line position of said view, said cam 89 will engage pendant 87 and tend to swing it downwardly toward a more nearly vertical position thus carrying down with it the adjacent end of the valve operating rod 85. Lever 78 is also provided with a notch 90 which is sufficiently deep to clear the adjacent end of rod 85 when said lever 78 is moved to the limit of its right hand movement as indicated by dotted lines in Fig. 2, it being understood that during this movement of lever 78 the guide arm 87, owing to the engagement of cam 89 therewith, will move the adjacent end of the valve operating rod 85 into register with said notch 90. But during the first part of the movement of said lever 78, the part 89*a* thereof between the notch 90 and cam 89 will engage the end of the valve operating rod 85 and cause a momentary additional opening of the valve 61.

The lower valve stem 62 has a working fit through a stuffing box 92 and the upper valve stem 73 has a working fit through the stuffing box 93 provided therefor, said stuffing boxes being in the form of nuts or externally screw threaded elements which are screwed into recesses which are provided therefor in the left hand wall of the casting 36 as seen in Fig. 2.

A leaf spring 85*c* yieldingly holds the free end of rod 85 against the upper end of the slot 86 of guide arm 87.

Nuts 62*a* are provided on valve stem 62 near the outer end thereof to keep said stem 62 from moving inwardly far enough to completely seat the valve 61, thus providing for a continuous supply of fuel to the primary pilot burner 52. When it is desired to shut off said burner 52 this may be done by means of the manually operable valve 54.

Ordinarily the valves 12 and 14 seen at the left of Fig. 1 will be closed, but the valve 13 of branch pipe 9 will be open thus supplying fuel to the pilot valve chamber 26 while cutting off the supply of fuel from the main burner tip 17. It is to be understood that the nuts 62*a* on valve stem 62 are to be so regulated that the spring 63 of said valve can not completely close the valve, but a small stream of fuel will be continually issuing through the primary pilot burner 52, which will ordinarily be kept continuously burning. Under these conditions, if the operator desires to start the torch into operation, he will first open the valves 12 and 14 to supply fuel and oxygen as required to the torch. He will then operate the lever 78 thus opening the fuel supply to the auxiliary pilot burner 50 and at the same time causing a momentary increase in the amount of fuel supplied to the primary pilot valve 52.

This momentary increase of fuel to the primary pilot valve will result from the cooperation of the valve operating stem 85, guide arm 87 and manually operated lever 78. The first part of the movement of said lever 78 causes the portion of said lever between its cam 89 and notch 90 to engage the adjacent end of the valve operating rod 85 during the first part of the movement of said lever, but the final part of the movement of said lever brings its notch 90 into register with the adjacent end of said rod 85 thus permitting the valve 61 (see Fig. 2) to return to its closed position under the action of its spring 63.

The brief inrush of additional fuel thus supplied to the primary pilot burner 52 will cause said burner 52 to flare up decidedly and

will thus make more certain the lighting to the secondary pilot burner 51, and said burner 51 will, in turn ignite the fuel issuing from the burner tip 17 of the torch.

A plurality of step-up pilot burners are thus provided to advance the pilot flame to the torch tip 17 in an effective manner.

Claims:

1. A torch provided with a main burner, a primary pilot burner, a secondary pilot burner positioned to be lit by said primary pilot burner, said secondary pilot burner being positioned to light said main burner, means to continuously supply fuel to said primary pilot burner, and means to momentarily augment the fuel supply of said primary pilot burner and simultaneously open a fuel supply to said secondary pilot burner.

2. In combination with the fuel supply and main burner of a torch, a plurality of pilot burners, one of said plurality of pilot burners being a primary pilot burner and being farther from said torch burner than the remainder of said plurality of burners, individual valves to control the fuel supply to the individual burners of said plurality of pilot burners, means continuously to hold slightly open the valve of said primary pilot burner, and manual operable means simultaneously to move to a more widely open position the valve of said primary pilot burner when the remaining pilot burner valve is actuated, said manually operable means having a path of movement near the completion of which it is disengaged from its operative relation to the valve of said primary pilot burner, and means automatically operating upon such disengagement to cause said valve of said primary pilot burner to return to its slightly open position, said plurality of pilot burner valves being arranged to step-up the flame from said primary pilot burner to the main burner of the torch.

3. In combination with the fuel supply and main burner of a torch, a primary pilot burner and a secondary pilot burner, said secondary pilot burner being adapted to step-up the pilot flame from said primary pilot burner to the main burner of the torch, valves to control the fuel supply to each of said pilot burners, means to maintain the valve of said primary pilot burner in a slightly open condition, a manually operable lever pivotally supported at one end, means operatively connecting said lever with the valve of said secondary pilot burner to open said valve when said lever is operated, said lever being provided with an impinging portion and a recess adjacent thereto, and means to operate the valve of said main pilot burner, said last named means being in position to be operated by said impinging portion during the first part of the movement of said lever and when said first part of the movement thereof is completed, coming into register with said recess and thereby being disengaged from its operative relation to said lever.

4. In combination with the fuel supply and main burner of a torch, a secondary pilot burner positioned to light said main burner, a primary pilot burner positioned to light said secondary pilot burner, fuel supply means for said pilot burners, a fuel supply valve for said secondary pilot burner, a fuel supply valve for said primary pilot burner, said last mentioned valve being normally maintained in a slightly open position to keep said primary pilot burner burning, and a manually operable lever to operate both of said pilot burner valves, said lever having a continuous operative connection with the valve of said secondary pilot burner and having an operative relation also with the valve of said primary pilot burner, the last mentioned operative relation providing for a momentary opening movement of the valve of said primary pilot burner during the first part of the travel of said lever and thereafter disengaging said lever, and means to automatically return the valve of said primary pilot burner nearly to its closed position when such disengagement occurs.

5. In combination with the fuel supply and main burner of a torch, a secondary pilot burner positioned to light said main burner, a primary pilot burner positioned to light said secondary pilot burner, a fuel supply means for said pilot burners, and means to open the fuel supply to said secondary pilot burner and simultaneously momentarily increase the fuel supply to said primary pilot burner, said means comprising a manually operable lever.

6. In combination with the fuel supply and main burner of a torch, a secondary pilot burner positioned to light said main burner, a primary pilot burner positioned to light said secondary burner, a fuel supply means for said pilot burners, and manually operable means to open the fuel supply to said secondary pilot burner and simultaneously momentarily increase the fuel supply to said primary pilot burner.

7. A torch having a main burner and comprising a casing within which is contained a pilot burner fuel supply chamber, a fuel supply pipe leading to said main burner, a fuel supply pipe leading to said chamber, a primary pilot burner, a secondary pilot burner positioned to be lit by said primary burner, said secondary pilot burner being positioned to light said main burner, each of said pilot burners being fed from pipes which communicate with said chamber, a valve for each of said last recited pipes to control the supply of fuel therethrough, a common operating means for said valves to coordinate their action, and a manually operable element to actuate said common operating means.

8. A torch having a main burner and com-

prising a casing within which is contained a pilot burner fuel supply chamber, a fuel supply pipe leading to said main burner, a fuel supply pipe leading to said chamber, a primary pilot burner, a secondary pilot burner positioned to be lit by said primary burner, said secondary pilot burner being positioned to light said main burner, each of said pilot burners being fed from pipes which communicate with said chamber through a wall thereof which is directed towards said pilot burners, said last named pipes communicating with passages which open interiorly of said chamber, two valves within said chamber, said valves each controlling one of said passages, each of said valves having a stem which projects through the wall of said casing opposite to said passages, and manually operable means connecting with the projecting portions of said valve stems to coordinately control the opening and closing of said valves.

In testimony whereof I hereunto affix my signature.

JAMES C. ROACH.