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QUICK GENERATING TORCH

Filed June 23, 1930

Fig. 1.

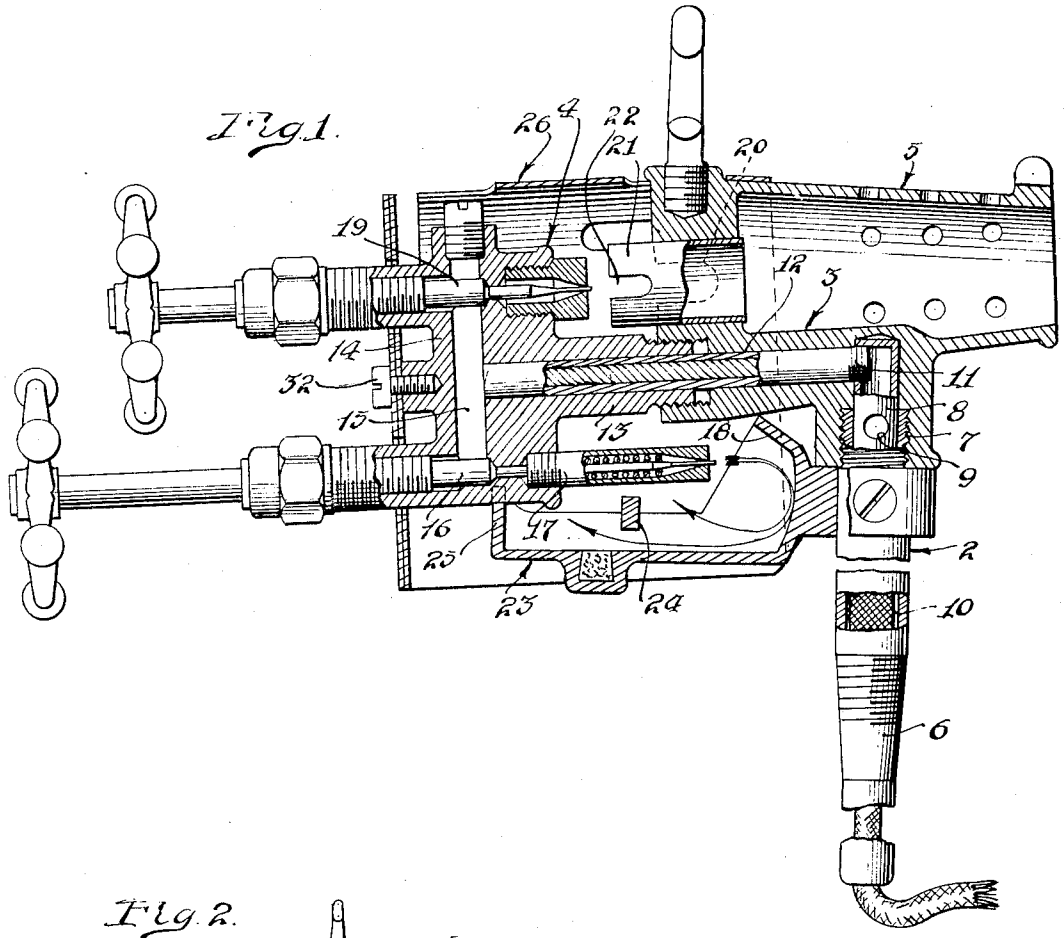


Fig. 2.

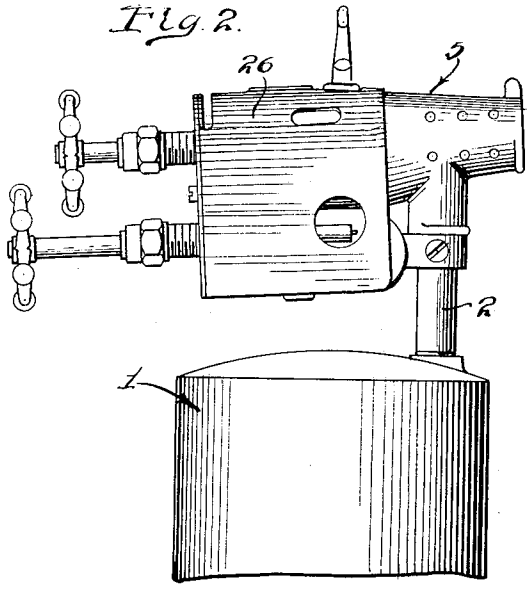
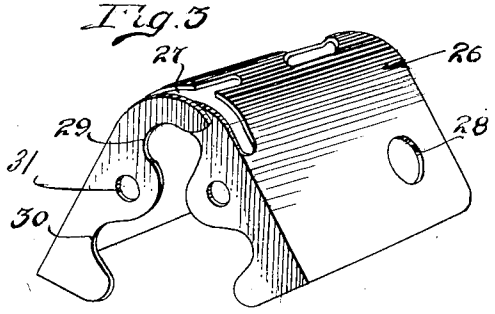


Fig. 3



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QUICK GENERATING TORCH

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14 Claims. (Cl. 158—33)

This invention relates to a quick generating torch, and has to do with novel compact means forming a permanent part of the torch for initially accelerating and maintaining normal vaporization independently of the main generator.

Heretofore in starting standard type blow torches it has been customary to utilize an open flame from a drip pan or the like. In Patent No. 1,750,846 of March 18, 1930, a combined blast deflector and drip cup is disclosed, the blast deflector being utilized to initially deflect the fuel vapors issuing from the generator backwardly against the generator to accelerate initial vaporization and starting thereof, after which the blast deflector is moved out of position to permit normal operation of the same generator tube in supplying the vaporized fuel to the mixing chamber.

The device of the present invention embodies a somewhat similar blast deflector as a part of its structure and method of operation. However, the blow torch of the present invention embodies a novel arrangement of generating and starting structure, wherein the effect is obtained of one torch heating another.

More specifically, the present invention embodies a blow torch of substantially standard construction, and very similar to the type described in the application to Blaskewitz Serial No. 224,324 filed October 6, 1927, but with the addition of compact conveniently arranged quick generating means positioned immediately below and generally parallel with the main torch burner. The main generator tube terminates in a header which carries the burner nozzle as well as the auxiliary generating tube. A permanent combined blast deflector and drip cup is adapted to be permanently positioned adjacent the auxiliary generating tube and said drip cup is so designed and positioned that any blast emanating from the auxiliary generating tube is divided so that a part of it is directed against said tube and the other part against the burner head. The result is a quick generating torch combining sturdy, compactly arranged units.

Another feature of the present invention resides in means for materially retarding the accumulation of carbon, and this is accomplished by means of a novel design and assembly embodying a ferrous conduit for conducting the fuel through the main generator tube to the burner head.

Other features of the present invention reside in a novel shield structure for assisting and directing the flames from the blast deflector in the heating of the burner head together with a novel arrangement of parts for materially assisting in assembly and disassembly of the unit.

In the drawing:

Fig. 1 is a longitudinal sectional view of a quick generating blow torch combining the features of the present invention and illustrating in particular the preferred arrangement of the various parts for controlling the operation of the torch.

Fig. 2 is an elevation of the torch.

Fig. 3 is a perspective view of the shield unit as fabricated preparatory to assembly.

In addition to obtaining a quick generating torch, one of the main features of the present invention is the provision of extremely simple and compact cooperating parts which provide for quick assembly so as to greatly increase the efficiency of original assembly as well as for adjustment and cleaning. The illustrated device embodying these structural elements comprises generally a tank 1 of standard design for receiving and holding the fuel under pressure, a fuel conduit or standard 2, a main generator or vein tube 3, a burner nozzle 4, and blast nozzle 5. So much of the structure is somewhat standard and similar to that disclosed in said application to Blaskewitz Serial No. 224,324.

The fuel conduit preferably consists of a suitable feed pipe 6 which extends down into the torch tank in the usual manner and which terminates in threaded engagement with the blast nozzle casting as at 7. A steel sleeve 8 is preferably positioned as shown and may be called a vein tube inlet sleeve. This steel sleeve is provided with an aperture as at 9 for the purpose of preventing circulation and accumulation of pressure. The feed pipe may be provided with a suitable strainer 10 and the inlet sleeve 8 may protrude down into the feed pipe any suitable distance.

The inlet sleeve 8 is preferably provided with a threaded aperture as at 11 for receiving the inlet end of a main generator or vein tube 12. This vein tube preferably has very close fit in the aperture in the casting and is preferably of steel the same as sleeve 8. It will be noted here that the blast nozzle housing or shell is preferably formed of brass or similar metal of relatively high heat conductivity while the sleeve 8 and the tube 12 are formed of steel or similar ferrous metal.

It has been found that by using steel tubes, as shown, carbon does not stick to the steel so readily during operation. Other than the fact that carbon apparently does not stick so readily to steel as brass or similar metals no other theory is advanced for this, but it has been found from exhaustive experiments that a blow torch of the

type illustrated will operate about ten times as long with sleeves of steel, as with plain passageways formed of brass or similar metal, before carbonizing up. The main function of the steel sleeves is therefore to materially reduce carbonization and whatever tendency the steel tubes may have to cause the torch to run cold is more than overbalanced by the reduction of carbonization. Any such tendency of the torch to run cold is also prevented by reason of the auxiliary burner structure as will be later pointed out.

The vein tube 12 is adapted to slidably but closely fit within an extension 13 of a unit which may be designated generally as a burner head 14. This extension 13 is adapted for threaded engagement with the blast nozzle housing as best indicated in Fig. 1, and the entire burner head structure is adapted to be assembled as a unit with the insertion of said extension 13 into threaded engagement with the blast nozzle housing.

In the structure of this burner head, the vein tube 12 terminates in a passageway 15 which extends substantially the length of the burner head and terminates at its lower end in a valve casing which in turn receives a suitable valve stem 16. This valve stem 16 is adapted to control the flow of liquid or gaseous fuel into an auxiliary generator tube 17.

The generator tube 17 is preferably formed of very thin metal so as to permit quick transmission of heat therethrough. In addition to its normal valve seat the valve stem 16 is provided with an extension the end of which carries a suitable cleaner needle as is well understood in the art. By retracting the valve stem 16, it will be obvious that fuel will be fed into the auxiliary generator tube 17 and projected outwardly therefrom against the blast deflector 18.

The passageway 15 preferably passes through the upper end of the burner head whereby the same may be readily cleaned by the removal of a suitable plug. The upper end of this passageway 15 also communicates with the valve casing formed in a laterally positioned passageway. This valve casing is adapted to receive a suitable valve stem 19 which is provided with a valve seat and an extension stem for cleaning out the burner nozzle in much the same manner as described with reference to the valve stem 16. The sole function of the burner nozzle here, however, is to direct the vaporized fuel into the blast nozzle 5 whereas the member 17 acts as a combined generator and burner nozzle.

The auxiliary generator member 17, is of necessity, of some length and in order to permit the burner head to be screwed into position the blast nozzle housing is provided with a cut away portion as shown in dotted lines as at 20. The entrance head of the blast nozzle 5 is provided with an aperture in alignment with the valve stem 19 and is adapted to receive an adjustable induction tube 21. This induction tube is normally adapted to be held in position by a suitable set screw but it may be readily removed or at least forced inwardly to such an extent that the cut away portion 20 is left open so that as the burner head is screwed into position or removed the auxiliary tube 17 will pass through said opening 20 in its movement about the tube 12 as an axis.

After assembly, with the burner nozzle and auxiliary generator tube in vertical alignment, as shown, then the induction tube 21 may be suitably adjusted to obtain the correct combustible mixture. The induction tube is preferably provided with a notch 22. The purpose of this notch is to permit ready ignition of the fuel vapor issuing from the main burner nozzle by flames projecting upwardly from the auxiliary generator tube or nozzle. Without such a notch in the induction tube, it will be found that there is often too great a blast or velocity to permit automatic lighting of the blast in the blast nozzle.

The combined drip cup and blast deflector may be generally designated 23 and this unit in addition to the blast deflecting surface 18 is so shaped as to hold a small body of liquid. This liquid may be obtained by opening the valve stem 15 to allow a small amount of raw liquid to be projected against the blast deflector and directed downwardly into the drip cup. When the drip cup is about half full, this valve is preferably closed as will be later explained.

The drip cup is provided with a cross member 24 which is spaced above the bottom of the drip cup so as to form what may be termed a split drip cup. The purpose of this member 24 is to assist in directing a part of the rearwardly deflected blast of flame against the small auxiliary tube 17 and the other part of the flame backwardly against the burner head 14. Thus the part of the flame which is directed rearwardly by the blast deflector will strike against and pass above the member 24, while the other part will pass underneath said member 24 so as to pass rearwardly and upwardly against the head 14. The end 25 of the drip cup opposite the blast deflector is preferably bifurcated and extends upwardly a short distance around the bottom of the head to help direct the rearwardly deflected flames upwardly against the header. The entire unit consisting of the blast deflector and drip cup is preferably adjustably mounted on the standard 2 with the result that it can be readily removed to permit disassembly or readily adjusted so as to accurately control the manner of directing the blast of flame rearwardly.

A shield member which may be generally designated 26 is preferably fabricated from a single sheet of metal and folded into the position shown in Fig. 3. This shield is slotted as at 27 to permit of ready flexure and also to assist in drawing the flames upwardly around the burner head. One side wing is provided with a suitable opening 28 which is adapted to be positioned adjacent the drip cup whereby the fuel in the drip cup may be initially ignited. The rear end of each side wing is preferably folded into shape, as best shown in Fig. 3, the cut away portions 29 and 30 surrounding and enclosing valve stems. Apertures 31 are provided so that when the shield is positioned over the burner head and closed together, these apertures will register. As best shown in Fig. 1, a suitable projection is provided for receiving a screw 32 whereby when the shield is folded together it may be held in folded position by the insertion of the screws 32 in the registering apertures 31.

In operation, after the liquid fuel in the tank has been placed under pressure, the same will be forced upwardly through the sleeve 8, vein tube 12, and to the burner head. Opening of the valve 16 will allow a small stream of liquid fuel to be forced from the auxiliary member 17 against the baffle 18 to be deflected downwardly into the drip cup. After the drip cup is about half full, the flow of liquid fuel may be stopped and such liquid fuel in the drip cup ignited. The walls of the member 17 being relatively thin, and the space therein being taken up generally by a coil spring, it will be seen that the small

amount of liquid will be quickly heated by the open flame from the drip cup.

As the liquid fuel within the member 17 is vaporized, it will be forced outwardly around the cleaner stem so that such vapor will strike the baffle and be deflected downwardly and rearwardly in the form of a blast of flame. This blast of flame will accelerate the burning action of the open body of liquid fuel in the drip cup and will also accelerate the heating of the tube 17, the preheater tube thus becoming thoroughly heated in a very short time. As the open body of fuel is gradually consumed, more of the rearwardly directed blast will heat the burner head. When the fuel in the drip cup is nearly burned out the valve 16 may be opened slightly with the result that a strong rearwardly directed blast of flame will play upon the back part of the burner unit, or what has been termed the burner head.

Of course, a part of this blast of flame, which is truly a blue blast of flame, will strike the preheater tube 17 to maintain vaporization of the fuel passing therethrough, but a large part of said blue blast is for the purpose of heating up the burner head so as to place the same in such heated condition as to sufficiently vaporize the liquid fuel therein. The burner head being formed of one piece, it will be obvious that the heat will be transmitted upwardly by conduction so as to materially raise the temperature of the extension member 13 and the vein tube 12. It will be understood here that the vein tube 12 may be filled with wire cord or any other suitable means as in standard practice.

After the blue blast of flame from the preheater tube and auxiliary burner has been burning for about a minute, the upper valve 19 may be slightly opened and the generated gas issuing from the burner nozzle will be ignited by the flame from the rearwardly directed blast of flame or from flames which might be still rising from the pre-heater cup. The flame from the burner nozzle will be directed forwardly through the blast nozzle in the regular manner, part of such flame striking the portion 3 so as to preheat the main generator or vein tube. When the flame from the burner nozzle is burning steadily the lower valve may be completely turned off as vaporization will be maintained by the main blast from the burner nozzle. In extreme cold and winter weather the lower burner may be kept burning, and also in any conditions where the torch might have a tendency to run slightly cold the lower valve may remain open so that a continuous blast of flame is directed against the burner head to thus insure a continuous hot blast from the main burner nozzle.

The shield member 26 aids materially in the heating up of the burner head as it confines the rearwardly directed blast of flame to the immediate surfaces of the burner head and assists in directing the course of said blast of flame rearwardly and upwardly around the burner head. The use of the steel tubes materially reduces the tendency of clogging up due to carbonization but when the blow torch does become clogged the cleaning of the same becomes a very easy matter as it is only necessary to either take out the clean-out plug of the passageway 15 or in the event of complete cleaning it is only necessary to remove the shield, remove or push the induction tube 21 forwardly and then unscrew the complete burner head. The vein tube may then be unscrewed to permit removal of the sleeve 8 and thus insure a complete cleaning of all parts.

What we claim is:

1. A liquid fuel burner, comprising a main burner nozzle and generator tube adapted to be heated thereby for vaporizing the main supply of liquid fuel, a burner head, a combined preheater tube and burner nozzle positioned beneath said main burner and burner head, and a blast deflector stationarily positioned adjacent the end of said preheater tube for directing a blast of flame rearwardly against said burner head.

2. A blow torch comprising a separately formed blast nozzle, curved surface blast deflector, and burner head adapted to be secured together and in place as a single unit, and comprising a main burner nozzle carried by the burner head for directing a blast of flame into the blast nozzle, and an auxiliary nozzle carried by said burner head for directing a blast of flame against the curved surface of said blast deflector.

3. A blow torch comprising a blast nozzle, a blast deflector, and a burner head adapted to be secured in place as a unit to the blast nozzle, and comprising a main burner nozzle for directing a blast of flame into the blast nozzle, and an auxiliary nozzle positioned substantially at right angles to said deflector for directing a blast of flame against said blast deflector.

4. A blow torch comprising a blast nozzle and blast deflector, and a burner head adapted to be secured as a unit to the blast nozzle and comprising a main burner nozzle for directing a blast of flame into the blast nozzle, and an auxiliary nozzle for directing a blast of flame against said blast deflector, said blast deflector being so positioned relative to said auxiliary burner nozzle that said blast of flame is directed against said burner head.

5. A blow torch comprising a pressure tank, a fuel feed pipe serving as a standard, a blast nozzle supported by said standard, said blast nozzle including a generator tube and an adjacent flame contacting surface for effecting vaporization of the fuel, and a burner head comprising a main burner nozzle and auxiliary nozzle adapted to be removably secured to and supported by said blast nozzle, said main burner nozzle and auxiliary burner nozzle being positioned in vertical alignment, the one nozzle cooperating with the blast nozzle and the other nozzle cooperating with a stationarily mounted blast deflector adapted to deflect the vapor issuing therefrom in the form of a blast against the burner head.

6. A blow torch, comprising a burner head having a main nozzle and a forwardly extending auxiliary nozzle for projecting a blast of flame forwardly in the same general direction, a generator tube positioned generally parallel to the blast of flame to the main burner and being heated thereby and means positioned substantially at right angles to said auxiliary nozzle for deflecting the forwardly projected blast of flame from the auxiliary nozzle against said burner head.

7. A blow torch comprising a burner head having a main nozzle and an auxiliary nozzle for projecting a blast of flame forwardly in the same general direction, a generator tube positioned generally parallel to the blast of flame to the main burner and being heated thereby, and means for deflecting the forwardly projected flame from the auxiliary nozzle rearwardly against the burner head.

8. A blow torch having two forwardly directed burner nozzles and a common header structure, a blast deflector positioned in front of one nozzle

for directing all of the vapor issuing therefrom rearwardly in the form of a blast of flame against said common header, and a main generating surface positioned adjacent the blast of flame issuing from the other nozzle whereby to vaporize the main supply of fuel fed to the nozzle.

9. A blow torch having two forwardly directed burner nozzles and a common header structure, a blast deflector positioned in front of one nozzle for directing all of the vapor issuing therefrom rearwardly in the form of a blast of flame against said common header, a main generating surface positioned adjacent the blast of flame issuing from the other nozzle whereby to vaporize the main supply of fuel fed to the nozzle, and means for splitting said rearwardly directed blast of flame whereby part of the flame is directed against the burner nozzle and another part against the burner head.

10. In a blow torch of the type having a main burner nozzle and a blast nozzle formed of metal of relatively high heat conductivity enclosing and forming a generator tube, a ferrous sleeve forming the inner walls of said generator tube for conducting the fuel to the burner nozzle.

11. A blow torch, comprising a burner nozzle, a source of fuel supply and a generator tube for vaporizing and conducting the fuel, the greater portion of the inner surface of said generator tube being formed of a ferrous material.

12. A blow torch, comprising a burner nozzle, a source of fuel supply and a generator tube for vaporizing and conducting the fuel, the greater portion of the inner surface of said generator tube being formed of a ferrous material, and the outer portion of said generator tube being formed of metal having a heat conductivity higher than said ferrous material.

13. A blow torch comprising, a main burner nozzle, an auxiliary burner nozzle and a common header member, a blast deflector for deflecting flames issuing from the auxiliary nozzle rearwardly in the general direction of said header and a shield enclosing said header and assisting in directing said deflected blast of flame up around said header member and towards said main burner nozzle.

14. A blow torch comprising a main burner structure including a main burner nozzle and an auxiliary preheater nozzle, a blast deflector and drip cup positioned adjacent said preheater nozzle and a unitary shield surrounding said burner structure, said shield having an opening for permitting igniting of the liquid fuel in the drip cup and so enclosing the burner structure as to assist in directing the deflected flames issuing from the preheater tube rearwardly and upwardly.

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