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2,539,595

BLOWTORCH

Filed Sept. 25, 1946

2 Sheets-Sheet 1

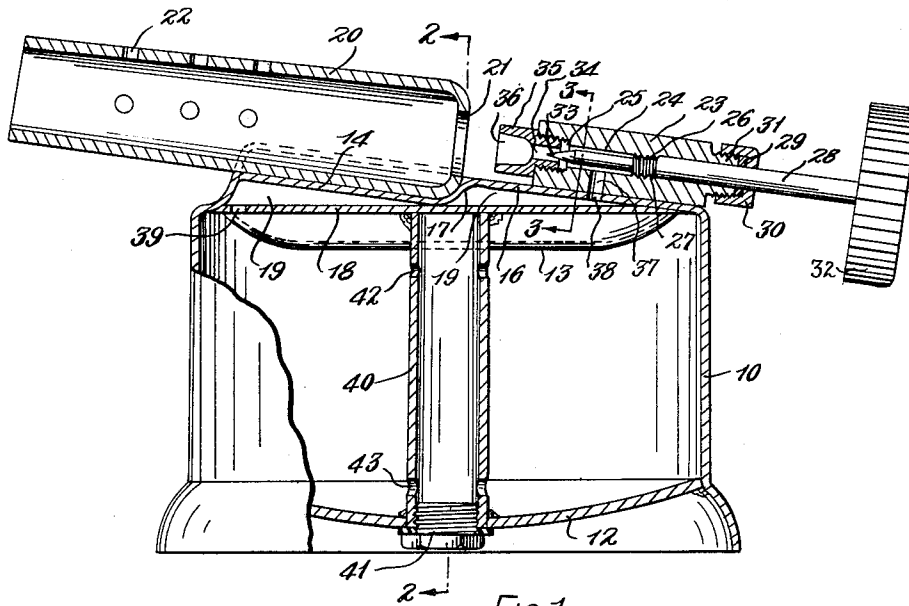


FIG. 1

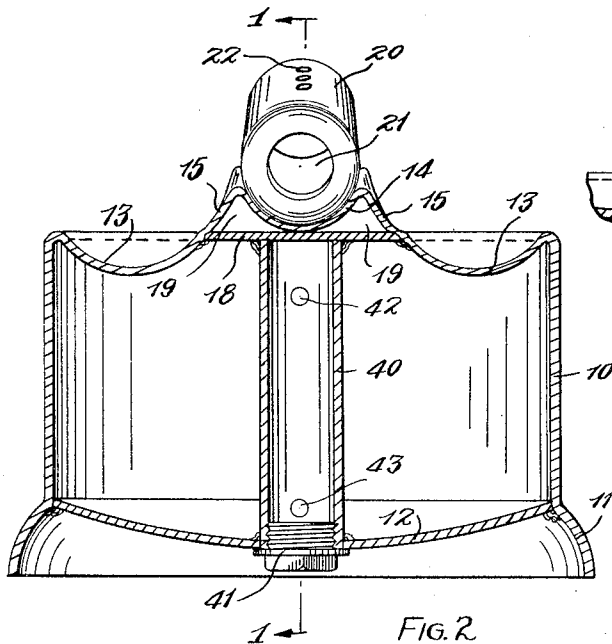


FIG. 2

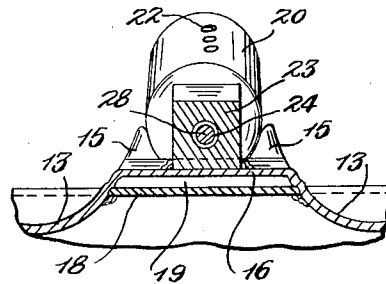


FIG. 3

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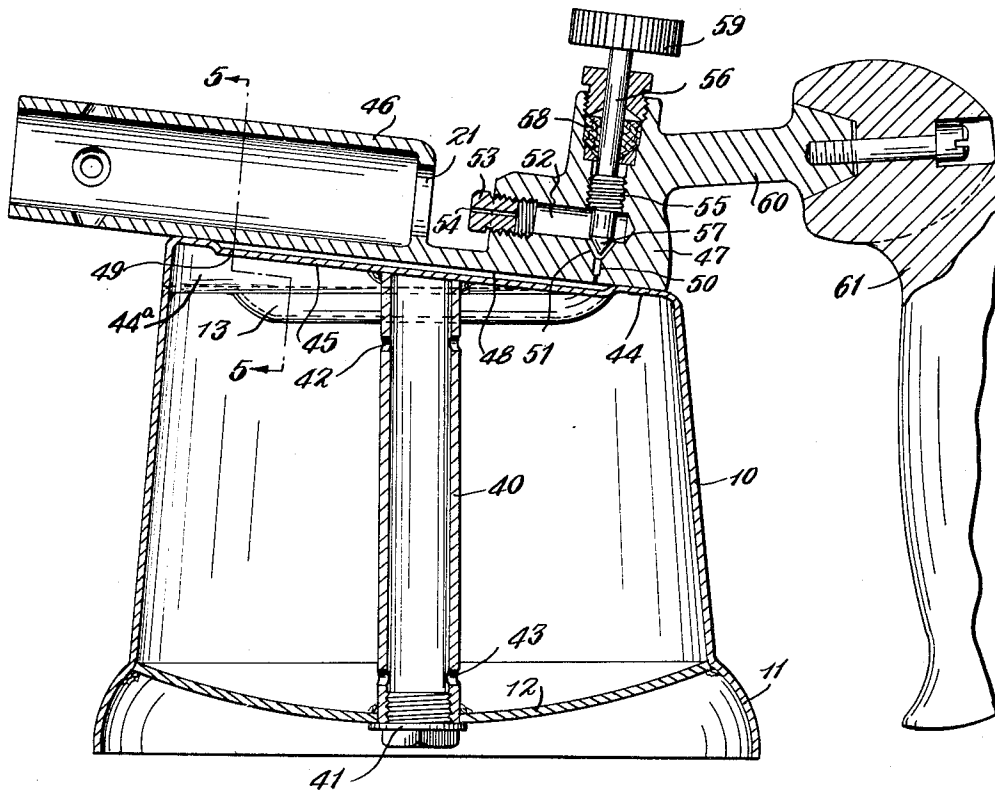


FIG. 4

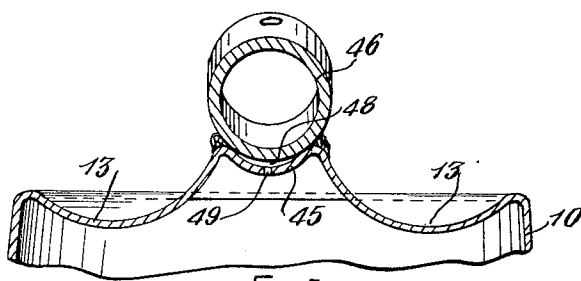


FIG. 5

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BLOWTORCH

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5 Claims. (Cl. 158—33)

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This invention relates to a blowtorch of the type wherein fuel feeding is effected by thermal vaporization of the fuel in the tank as distinguished from that type of torch utilizing pressure pump fuel feeding.

The main object of the invention is to provide a blowtorch of the type specified which is so constructed that it possesses the following advantages:

1. It is more efficient in operation than the prior torches;

2. There is a minimum loss of vaporizing heat due to radiation;

3. The torch maintains its efficiency of operation at all times, even when used out of doors in cold windy weather, even in sub-zero temperatures;

4. Complete vaporization of the fuel occurs thus increasing torch efficiency, causing maximum heat to be produced at the flame nozzle, and requiring a minimum amount of fuel in its operation;

5. The torch comprises a relatively few number of parts and eliminates certain parts now required in the torches of the prior art, thereby reducing the amount of material required in the torch construction, cutting to a minimum the machining and manufacturing operations involved in its production and enabling it to be produced by simple manufacturing operations, many of which are merely stamping operations.

A further and more specific object is to provide a blowtorch construction of the type specified and wherein the heat generated by the flame nozzle is substantially directly transmitted to the fuel in the tank as distinguished from being transmitted thereto by a relatively long conductive path as in the torches of the prior art.

Further and additional objects and advantages not hereinbefore specified will become apparent hereinafter in the detailed description of embodiments of the invention which is to follow.

Referring to the accompanying drawings illustrating said embodiments,

Fig. 1 is a view of one form of torch, partly in section and partly in elevation, the section being taken substantially on line 1—1 of Fig. 2 looking in the direction of the arrows.

Fig. 2 is a sectional view through the torch taken substantially on line 2—2 of Fig. 1 looking in the direction of the arrows.

Fig. 3 is a sectional view taken substantially on line 3—3 of Fig. 1 looking in the direction of the arrows.

Fig. 4 is a view similar to Fig. 1 but showing a modified form of torch, and

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Fig. 5 is a sectional view taken substantially on line 5—5 of Fig. 4 looking in the direction of the arrows.

The torch comprises a fuel tank 10 which is formed of suitable material, preferably stamped metal. The tank 10 is of generally inverted cup shape and is provided at its lower or free edge with an outwardly bowed or flared portion 11 forming the base or stand on which the torch may rest. A bottom 12 for the tank extends across its open and lower end and preferably is secured to the interior of the tank adjacent the inner end of the flared or bowed portion 11 by welding or by any other suitable means. The bottom 12 preferably is downwardly bowed but only to such an extent as to be housed within the flared portion 11. The upper or closed end of the tank 10 is stamped so as to have one or more depressions 13 formed therein and preferably extending chordally of the upper end of the tank and on opposite sides of a cradle or trough 14 for the flame nozzle 20 and an inclined supporting surface 16 for the torch valve block 23.

The cradle for the flame nozzle is stamped in the upper end of the tank 10 so as to provide a trough 14 extending partially diametrically of the tank and upwardly inclined from the center of the tank toward the circumference thereof. The trough 14 is integrally connected to the depressions 13 by portions 15. The closed or top end of the tank 10 in line with the trough 14 is provided with an inclined supporting surface 16 that extends in a diametrical direction and is inclined downwardly from the center of the tank toward its circumference in an inclined plane parallel or substantially parallel to the inclined plane of the bottom of the trough 14 as clearly indicated in Fig. 1. The trough 14 and the inclined surface 16 are integrally connected by an upwardly extending portion 17.

A plate 18 is located within the tank 10 and extends diametrically of the tank intermediate the depressions 13 and is welded or otherwise suitably secured to the interior of the tank. The plate 18 may be secured in position prior to the bottom 12 being secured to the tank, thus providing easy assembly. The plate 18 forms with the trough 14, portions 15, inclined surface 16 and portion 17 a vaporization chamber 19 which extends the full length of the trough 14 and the surface 16.

A flame nozzle 20 is mounted in the cradle or trough 14 and is permanently secured thereto by welding or other suitable means. The nozzle 20 is tubular and at its inner end is closed except for a flame opening 21. The nozzle 20 is provided intermediate its ends with a plurality of air vent openings 22 to provide suitable amounts of air for combustion of the va-

porized fuel in the nozzle during the use of the torch. If desired, a slidable sleeve, not shown, could be positioned over the nozzle so as to be moved to expose a greater or a fewer number of the openings 22.

A valve block 23 is rigidly secured to the inclined surface 16 by welding or other suitable means. This block is provided with a longitudinally extending bore 24 that terminates at its inner end with a threaded counterbore 25. The bore 24 is provided with a threaded portion 26 with which cooperate the threads 27 on a large diameter portion of a valve rod 28. The valve rod 28 extends through a gland packing 29 and a gland nut 30 screwed upon the externally threaded reduced nipple 31 on the outer end of the block 23. The outer end of the rod 28 is provided with an operating knob 32 whereby the rod may be turned to cause it to screw inwardly and outwardly of the bore 24 to adjust the position of the pointed needle valve 33 formed on the reduced inner end portion of the rod. The needle valve 33 extends into the counterbore 25 and into the bore 34 formed in a removable valve plug member 35 that has a reduced externally threaded portion screwed into the counterbore 25 and an enlarged portion provided with a somewhat flared counterbore 36 that communicates with the bore 34 and is in alignment with the opening 21 of the flame nozzle. The bore 24 in the body 23 communicates with a laterally extending passage 37 in said body and said passage in turn registers with an opening 38 in the inclined surface 16, wherefore that portion of the bore 24 intermediate the valve 33 and the threads 27 of the rod is in communication with the vaporization chamber 19, it being noted that the rod 28 between the threads 27 and the valve 33 is of reduced diameter so as to provide a clearance between it and the wall of the bore 24. The plate 18 is provided with an opening 39 placing the interior of the tank 10 in communication with the vaporization chamber 19, wherefore it will be seen that said vaporization chamber, bores 24 and 34 and counterbore 36 are in communication with the interior of the tank.

A tube 40 is located within the tank centrally thereof and has its upper end secured to the underside of the plate 18 and its lower end interfitted an opening in the bottom 12. The tube 40 is secured to the plate 18 and the bottom 12 by suitable means such as by welding or the like. The interior of the lower end of the tube 40 is threaded to receive a removable filling plug 41 which when screwed into position is housed within the flared portion 11 of the tank. The tube 40 adjacent its upper end is provided with openings 42 and adjacent its lower end with openings 43.

When the tank is to be filled with a suitable fuel, such as gasoline or any other thermally vaporizable fuel, it is inverted and the filling plug 41 is removed. The fuel may then be introduced to the tank through the tube 40 from whence it will flow through the openings 42 and the openings 43 into the interior of the tank. When a sufficient quantity of fuel has been introduced into the tank the plug 41 is screwed into closed position and then the torch is returned to its upright position. The operator then approximately adjusts the valve 33 by turning the knob 32. He then places a quantity of fuel in the depressions 13 and ignites such fuel to produce the initial heat for vaporization of the fuel in the tank. The burning fuel in the depressions 13 produces heat which is transmitted directly to the interior of the

tank and by conduction to the flame nozzle 20 and the block 23. This heat causes the fuel in the tank to vaporize whereupon the vaporized fuel flows into the chamber 19 where it is further vaporized by the heat from the burning fuel in the depressions 13. The vaporized fuel then flows from the chamber 19 through the opening 38 and passage 37 into the bore 24 and past the valve 33 and into the counterbore 36. The operator now ignites the vaporized fuel passing outwardly of the counterbore 36, as will be well understood in the art to produce a flame in the nozzle 20. After the vaporized fuel is ignited the operator will adjust the valve 33 by the knob 32 to obtain the flame he desires. The heat produced by the flame at the nozzle 20 is transmitted directly to the vaporization chamber 19 and thus maintains the maximum vaporization heat in said chamber.

Inasmuch as the flame nozzle 20 is supported directly by the upper end of the tank 10, with only the vaporization chamber 19 and the plate 18 intervening between the nozzle and the interior of the tank, it will be seen that the heat from the nozzle is transmitted substantially directly to the interior of the tank to provide the maximum heat for the initial vaporization of the fuel in the tank to cause such vaporized fuel to flow into the vaporization chamber 19 to be finally and completely vaporized. In addition, the tube 40 will conduct heat from the plate 18 to the interior of the tank and also the heat will be conducted from the nozzle 20 to the interior of the tank by the portions 15 and the depressions 13 of the top of the tank. Therefore maximum heat for vaporization of the fuel in the tank and in the chamber 19 is obtained with a minimum likelihood of such heat being dissipated by radiation and the like.

In the prior art torches wherein fuel feeding is effected by heat vaporization of the fuel in the tank, the flame nozzles have been located substantial distances from the tanks and the heat from the nozzles is transmitted to the tanks through relatively long conductive paths formed by tubular stems supporting the nozzles and extending into the tanks. Therefore the arrangement of the prior art torches provides substantial heat losses by radiation, with the result that the desired heat for vaporization of the fuel is not obtained at all times, particularly when the torch is being used out of doors in cold windy weather, at which time the heat loss due to radiation is greatly increased.

The torch embodying the present invention is not subject to such criticism since, as pointed out, the heat from the flame nozzle is transmitted directly to the final vaporization chamber 19 and substantially directly to the interior of the tank 10 and also by relatively short conductive paths to the interior of the tank through the material of the tank and of the tube 40. Therefore the torch of the present invention assures maximum heat for the initial and the final vaporization of the fuel to provide for the feeding of the fuel and the proper combustion thereof. Consequently the efficiency of the torch is greatly increased and a hotter flame and a minimum consumption of fuel is the result. In addition, the torch is constructed of fewer parts than the prior art torches and said parts require a minimum amount of machining operations in their production and are formed in large part by simple stamping and welding operations.

In Figs. 4 and 5 a somewhat different form of torch embodying the invention is illustrated. Insofar as this modified form of torch corresponds

in construction with the previously described torch the parts are designated by the same reference characters.

The tank 10 in its top wall is provided with depressions corresponding to the depressions 13 of the previously described torch. It will be noted, however, that the diametral central portion 44a of the top wall 44 of the tank 10 of the modified torch projects above the remainder of the wall and is upwardly inclined from adjacent the right hand side of the torch as viewed in Fig. 4 toward the left hand side thereof. Intermediate the depressions 13 in the wall 44 and in the raised portion 44a there is provided a groove 45, the bottom wall of which is curved. This groove does not extend the complete diametral width of the tank but terminates inwardly of the circumference thereof to provide raised plane supporting surfaces adjacent the periphery of the tank for a nozzle and valve casting now to be explained.

In this form of torch the flame nozzle 46 and the valve block 47 are in the form of a unitary casting. The cross sectional radius of the flame nozzle and the block 47 is such that when the casting is superimposed from the top of the tank over the groove or trough 45 a space is provided between the casting and the wall of the groove and this space constitutes a vaporization chamber 48 extending from the opening 49 in the wall 44 to adjacent a passage 50 in the block 47 and which passage communicates with the vaporization chamber. The casting is welded or otherwise suitably secured in position on the top of the tank. Hence it will be seen that the vaporization chamber is provided without the necessity of utilizing any additional parts other than the flame nozzle, valve block and top wall of the tank.

The passage 50 terminates in an upwardly facing V-portion 51 which communicates with a bore 52 formed in the block in alignment with the opening 21 of the flame nozzle and threaded to receive a removable plug 53 that has a passage 54 therethrough of small diameter. The block 47 is also provided with a bore and counterbore longitudinally aligned with the passage 50 and in which the threaded portion 55 of a valve rod 56 can be screwed to adjust the tapered valve point 57 relative to the V-portion 51 of the passage 50, as will be well understood. Suitable packing and gland nuts indicated as a whole at 58 are assembled in the counterbore around the valve rod 56 and the latter is provided with an actuating knob 59. The block 47 is also provided with an integral extension 60 to which a torch handle 61 can be removably connected.

The operation of this modified form of torch is identical with the operation of the previously described form. It will be noted, however, that the modified form of torch eliminates the plate 18 of the previously described form and furthermore the flame nozzle is directly supported by the wall 44 which also forms one wall of the vaporization chamber and hence in this modified form of torch the heat from the nozzle is directly transmitted to the chamber and to the interior of the tank to vaporize the fuel therein for combustion and feeding purposes.

Although preferred embodiments of the invention have been illustrated and described herein it will be understood that the invention is susceptible of various modifications and adaptations within the scope of the appended claims.

Having thus described my invention, I claim:

1. A blowtorch of the type specified comprising a fuel tank, a flame nozzle, a regulating valve

cooperating with said nozzle, said nozzle and valve each being directly mounted on and secured to a wall of said tank, a vaporization chamber defined in part by said wall, and means placing said chamber in communication with said valve and the interior of said tank.

2. A blowtorch of the type specified comprising a fuel tank, a flame nozzle, a regulating valve cooperating with said nozzle, a wall of said tank being formed with a depressed trough and with a supporting surface, said nozzle and valve being superimposed directly on said trough and surface respectively and secured thereto, a vaporization chamber defined in part by the trough portion of said wall, and means placing said chamber in communication with said valve and the interior of said tank.

3. A blowtorch of the type specified comprising a fuel tank, a flame nozzle, a valve block having therein a valve cooperating with said nozzle, a wall of said tank having a diametrically extending raised portion part of which is in the form of a trough and part of which is in the form of a flat supporting surface, said nozzle and valve block being mounted respectively in said trough and on said surface and secured thereto, a plate secured interiorly of said tank beneath said trough and said surface and defining therewith a vaporization chamber, and means placing said chamber in communication with said valve and the interior of said tank.

4. A blowtorch of the type specified comprising a fuel tank, a flame nozzle, a valve block provided with a regulating valve cooperating with said nozzle, an end wall of said tank being provided with a central diametrically extending raised portion having a shallow trough for a portion of its length, said flame nozzle and valve block being positioned directly on said portion and overlying said trough and of such shape as to provide a space between said nozzle and block and the bottom of said trough to create a vaporization chamber, and means placing said chamber in communication with said valve and with the interior of said tank.

5. A blowtorch of the type specified comprising a fuel tank including a top wall having on its outer side a longitudinally extending raised integral portion forming part of a vaporization chamber, said top wall adjacent said raised portion being provided exteriorly with means adapted to receive fuel for starting the torch, a flame nozzle mounted directly on said raised portion, a regulating valve operatively associated with said flame nozzle and mounted on said top wall, and means in said top wall placing said fuel tank, said vaporization chamber and said regulating valve in communication with each other.

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