

July 23, 1929.

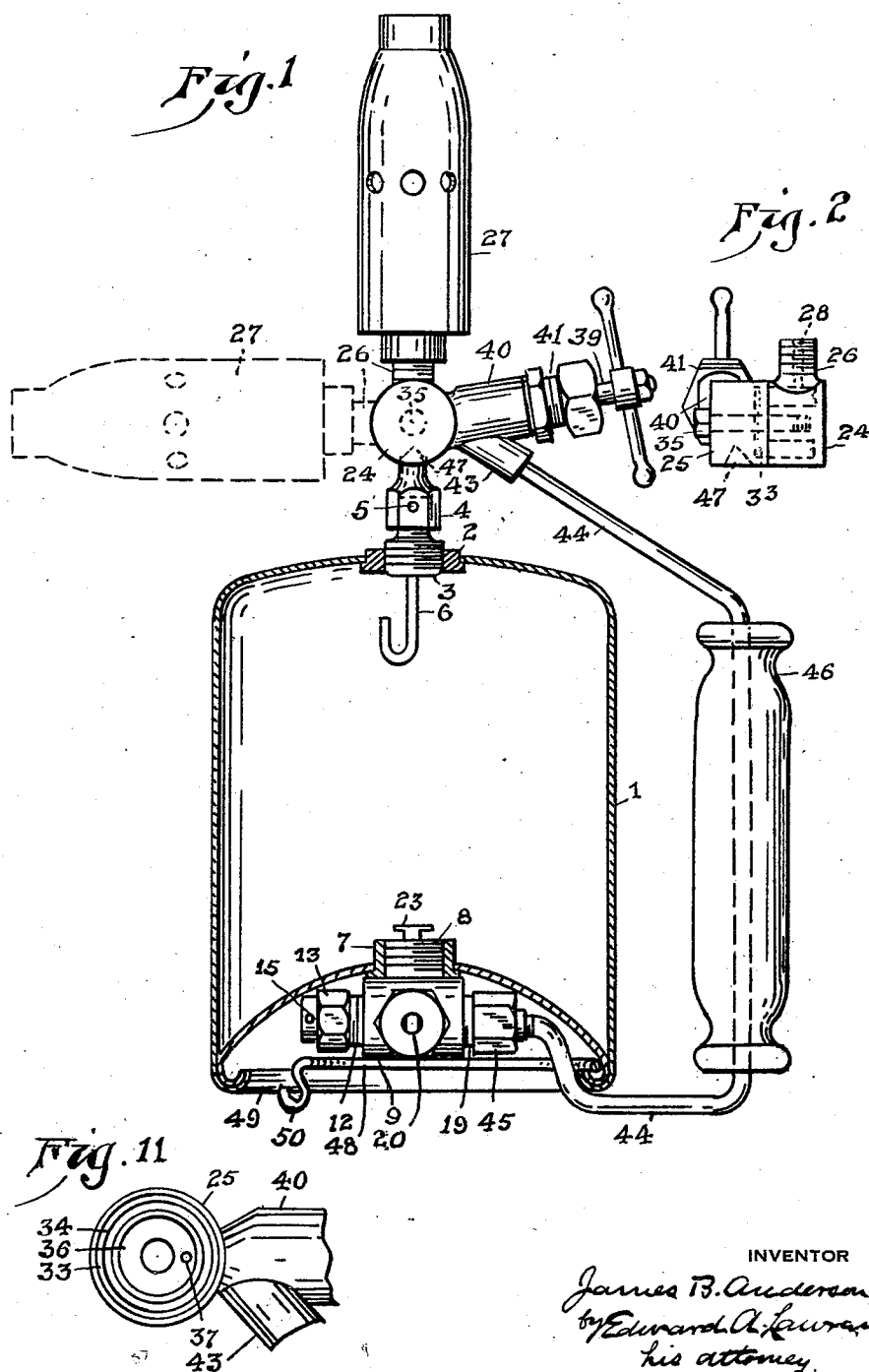
J. B. ANDERSON

1,721,844

BLOWTORCH

Filed Sept. 24, 1927

2 Sheets-Sheet 1



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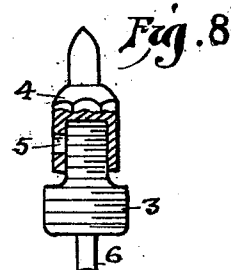
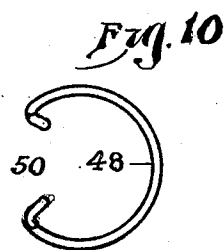
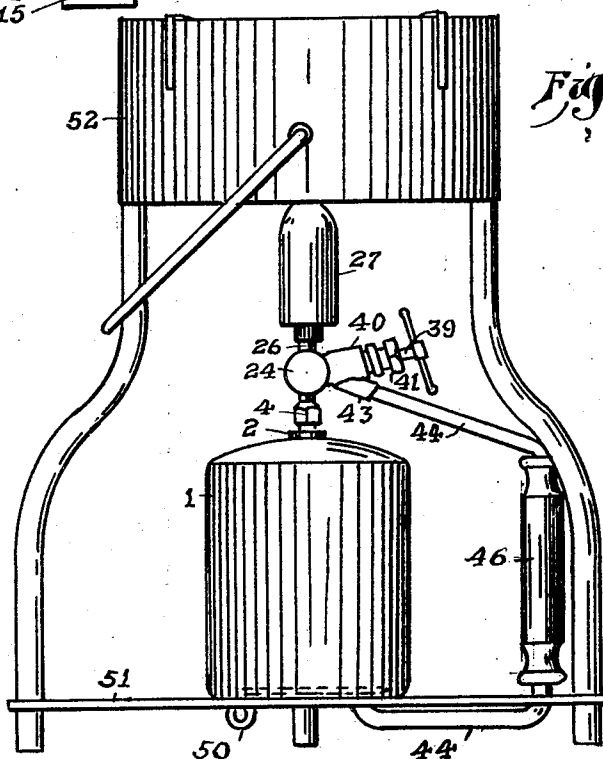
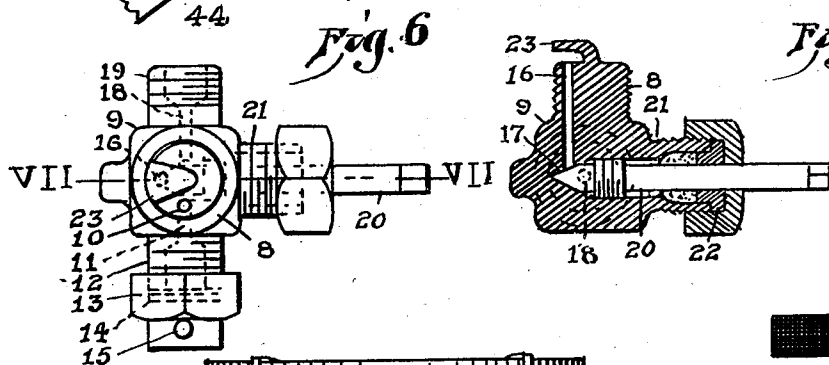
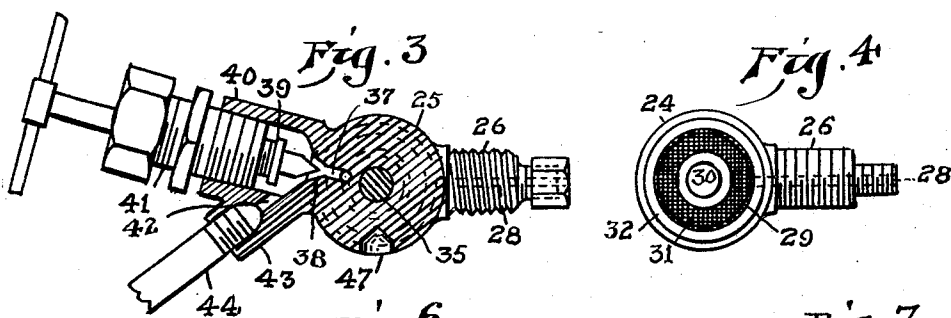
J. B. ANDERSON

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BLOWTORCH

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2 Sheets-Sheet 2



INVENTOR
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by Edward A. Lawrence,
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UNITED STATES PATENT OFFICE.

JAMES B. ANDERSON, OF SHALER TOWNSHIP, ALLEGHENY COUNTY, PENNSYLVANIA.

BLOWTORCH.

Application filed September 24, 1927. Serial No. 221,654.

More particularly, my improved blow torch is designed for use with liquid gas, such as hydrocarbon liquid gas.

One of the novel and characteristic features of my present invention is the provision of a blow torch in which the tank is interchangeable, so that when a tank has been emptied a full tank may be substituted in the torch without material loss of time.

Another novel and characteristic feature is the dispensing of the liquid gas from the bottom of the tank instead of from the top of the tank as in the present practice.

Another novel and characteristic feature is the improved gasification of the liquid gas by the time it reaches the burner.

Another novel and characteristic feature is the adjustability of the burner of the blow torch so that it may be positioned at any desired angle to the tank, so that the torch may be used for any of the usual purposes to which blow torches are applied or may be employed for heating a plumber's furnace.

Another novel and characteristic feature is the provision of means for determining the proper filling of the tank.

Other novel features of construction, and also of arrangement of parts will appear from the following description.

In the accompanying drawings, wherein I have illustrated the best embodiment of the principles of my invention now known to me, Fig. 1 is a side elevation of the blow torch, the burner being shown in full lines disposed vertically and in dotted lines adjusted into a horizontal position, and the tank being shown in vertical section; Fig. 2 is a view of the swivel-joint which supports the burner, the view being taken looking from the left in Fig. 1; Fig. 3 is a sectional view through one of the members of said swivel joint; Fig. 4 is an inner end view of the other member of said swivel joint; Fig. 5 is a view showing the screen which is mounted in said joint; Fig. 6 is a plan view of the bottom fitting of the tank; Fig. 7 is a sectional view taken along the line VII-VII in Fig. 6; Fig. 8 is a sectional detail of the filling indicator; Fig. 9 is an elevation showing the arrangement of the blow torch for heating a plumber's furnace; Fig. 10 is a plan view of the foot member of the tank, and Fig. 11 is an inner face view of one of the swivel joint members.

Referring to the drawings, 1 represents the

tank which may be of the usual shape and preferably provided with an upwardly concaved bottom. The top of the tank is provided with a central opening in which is welded with a gas-tight joint the threaded collar 2 into which is screwed the nipple 3 whose upper diameter is reduced and has screwed thereon the internally threaded cap 4. The cap 4 is provided with a port 5 in its side wall which is closed by screwing the cap down sufficiently on the nipple. The inner end of the nipple has connected to its bore the depending tube 6 whose lower end is curved upwardly. To test whether the tank has been sufficiently filled, the cap 4 is partially unscrewed to open the port 5. The outer end of the cap 4 is provided with a rounded taper for a purpose to be described.

In the center of the tank bottom there is a hole in which is welded with a gas-tight joint the screw collar 7 into which is screwed the vertical neck 8 of a fitting 9 which is also provided with three horizontal necks. The neck 8 is provided with a passage 10 whose upper end communicates with the interior of the tank and whose lower end connects with a passage 11 in the horizontal neck 12 of the fitting. The free end of the neck 12 is exteriorly threaded to receive the cap 13 which is provided with a frangible closure disk 14 which is ruptured when the tank pressure becomes dangerously excessive. The cap 13 is provided with a port 15 for the escape of pressure when the disk is ruptured.

The vertical neck 8 is provided with a second passage 16 whose upper end communicates with the interior of the tank 1 and whose lower end connects with a seat 17 whose other side is connected to a passage 18 which extends through the neck 19 of the fitting 9. The outer end of the neck 19 is exteriorly threaded for connecting the same with either the supply bottle for filling the tank or the dispensing tube to be later described. 20 is the needle valve which controls the valve seat 17 and which is mounted on the neck 21 of the fitting 9, being provided with a packing gland 22 to prevent the outward escape of gas along the needle valve. 23 is a hood which guards the upper end of the passage 16 and prevents the entering liquid from shooting directly up to the overflow indicator formed by the tube 6.

24 and 25 are the axially alined members of a swivel joint, the member 24 being provided

with an exteriorly threaded and radially disposed neck 26 upon which the burner 27 is screwed. The longitudinal passage 28 of the neck 26 connects at its inner end to the annular chamber 29 in the member 24. The chamber is open at the inner end of and closed at the outer end of the member 24.

Surrounded by the chamber 29 and concentric therewith is the internally threaded socket 30. 31 is an annular cup shaped screen which fits down into the chamber 29 about the socket 30 and which serves to filter the gas entering the burner.

32 is an annular rib having a flat end surface which is formed concentrically on the open end of the member 24. The member 25 has its inner end provided with an annular seat 33 which receives the rib 32 and the bottom of the seat 33 is provided with a concentric annular knife-edge flange 34 which bites into the rib 32 to form a gas-tight joint between the members 24 and 25 when they are clamped together. The two members are connected together by a bolt 35 which extends through an axial hole in the closed end of the member 25 and is screwed into the socket 30. By slightly loosening the bolt 35 one of the joint members may be rotated relative to the other member, and by tightening up the bolt the members may be fixed relative to each other.

It will be observed that a gas-tight joint is obtained between the two joint members without requiring the use of gaskets or packing of any kind.

The inner end of the member 25 is provided with a central chamber 36 from which a passage 37 leads to a needle valve seat 38 in the member 25. 39 is the needle valve for said seat, said valve being mounted in a neck 40 integral with the member 25, and a packing gland 41 being provided to prevent the outward escape of gas along the needle valve, 42 is a second passage in the neck 40 connecting at its inner end to the valve seat 38 and at its outer end to a threaded socket 43 into which one end of the tube 44 is screwed. The other end of said tube may be connected by means of a coupler 45 to the threaded neck 19 of the fitting 9. The tube 44 is bent into proper shape to form the torch handle, its intermediate portion being provided with a sleeve hand grip 46.

The joint member 25 has provided on its under side a tapered socket 47 into which the tapered outer end of the cap 4 is inserted. When the coupler 45 is screwed up to connect the lower end of the tube 44 with the fitting 9, the swivel joint structure is securely mounted on the torch. After unscrewing the coupler and releasing the lower end of the tube 44 the burner and its connections including the tube 44 may be lifted from the tank and if desired placed on a filled tank.

The tank is filled with liquid gas by cou-

pling the discharge tube of a supply bottle to the neck 19 of the fitting 9 and opening the needle valve 20.

The completion of the filling of the tank may be ascertained by partially unscrewing the cap 4 to unseat the port 5. If gas in a liquid form escapes up the tube 6, the tank is filled up to the inner end of the tube. The tank should not be entirely filled as it is desirable to maintain a gas-pressure above the body of liquid gas.

The burner 27 may be adjusted at any angle to the tank required for the use to which the torch is to be applied. Thus for general blow torch use, the burner is usually positioned at right angles to the axis of the tank 1, but when the torch is to be used for heating a plumber's furnace, as for melting solder or lead, or heating soldering irons, as shown in Fig. 9, that burner is swung up and clamped in a vertical position as shown in full lines in Fig. 1 and also in Fig. 9.

To enable the torch to rest flat on a horizontal surface, I provide a bent spring wire clamp 48 which fits in the inwardly curved bottom flange 49 of the tank land whose ends are extended downwardly and bent into loops 50 which act as feet and with the tube 44 give the torch a firm stance. When the torch is employed to heat a plumber's furnace, the floor 51 of the furnace 52 is apertured or slotted to give clearance for the tube 44 and the feet 50 so that the tank may rest on its bottom.

An important advantage of my improved blow torch is its great convenience. In the case of the blow torches now in use, when the tank is empty, the torch is out of service until it is refilled, which entails serious interruption to the work. In the case of my improved blow torch, the workman may be supplied with a plurality of already filled tanks, sufficient to last him for an extended period, and as one tank is exhausted, the workman closes the valve 20, unscrews the coupler 45, thus releasing the tube 44 and the burner and its connections are then lifted off the empty tank and placed on a filled tank and the pipe 44 coupled up to the fitting 9 of the new tank, the valve 20 adjusted to its proper open position and the torch is again ready for use, the operation of changing tanks occupying but a minute or so. Another advantage is that the bottles in which the supplies of gas are obtained are large and heavy and therefore unhandy to transport and store. The tanks are small and relatively light and occupy but small space in transportation and storage.

Again there is a positive and important advantage in dispensing the liquid gas to the burner from the bottom of the tank instead of from the top thereof as is the present practice. By taking off from the bottom I employ the hydrostatic head of liquid gas in the tank to and in the travel of the gas to the

burner. Thus I obtain a uniform and reliable head which is not obtainable when the supply is taken from the top of the tank wherein the gas has lost its liquid status. Thus I obtain a steady, uniform flame which does not pulsate. Again the extended tube 44, through which the gas travels to the burner is exposed to atmospheric temperatures so that the liquid gas which is at a temperature of something like 20 degrees Fahr. below zero in the tank is subjected to much higher temperatures during its travel to the burner so that its complete gasification before it reaches the burner proper is complete. Thus I obtain a steady, full value flame at the burner without the delay which is incident to starting the use of a blow torch wherein the gas is led to the burner from the tank by means of a relatively short tube.

The chamber 36 in the swivel joint acts as an expansion chamber for any gas that may reach the same in an ungasified or incompletely gasified condition.

In practice the needle valve 20 is opened to the proper degree to provide the necessary supply of gas from the tank, and the intensity and size of the flame at the burner may be nicely controlled by the valve 39. This provides a much more effective and delicate control than is possible with the blow torches now in general use.

What I desire to claim is:—

1. In a blow torch, the combination of a tank, a burner support detachably placed on said tank, a burner carried by said support, a dispensing fitting detachably connected to the bottom of said tank, and a tube exterior to said tank connected to said burner-support and to said fitting, said tube maintaining said burner-support in position on said tank.

2. In a blow torch, the combination of a tank, a filling and dispensing fitting con-

nected to the bottom of said tank, a burner-support provided with a socket, a projection on the top of the tank arranged to fit in said socket to mount the burner-support in place, a burner carried by said support, and a tube connecting said fitting with the burner, said tube being detachably connected to said fitting and maintaining said burner-support in position on the tank.

3. In a blow torch, the combination of a tank, a burner support having a portion formed to detachably engage the upper portion of said tank, a burner carried by said support, a dispensing fitting detachably connected to the bottom of said tank, and a bent tube having one end connected to said fitting and the other end connected to the burner support, the spring of said tube holding the burner support in place on said tank whereby by detaching the lower end of the tube from the fitting the tube, the burner support and the burner may be removed as a unit from an empty tank and installed on a full tank.

4. In a blow torch, the combination of a tank, a burner support having a portion formed to detachably engage the upper portion of said tank, a burner carried by said support, a dispensing fitting detachably connected to the bottom of said tank, and a bent tube having one end connected to said fitting and the other end connected to the burner support, the spring of said tube holding the burner support in place on said tank whereby by detaching the lower end of the tube from the fitting the tube, the burner support and the burner may be removed as a unit from an empty tank and installed on a full tank, said tube forming the handle of the tank.

Signed at Pittsburgh, Pa., this 23rd day of September, 1927.

JAMES B. ANDERSON.