

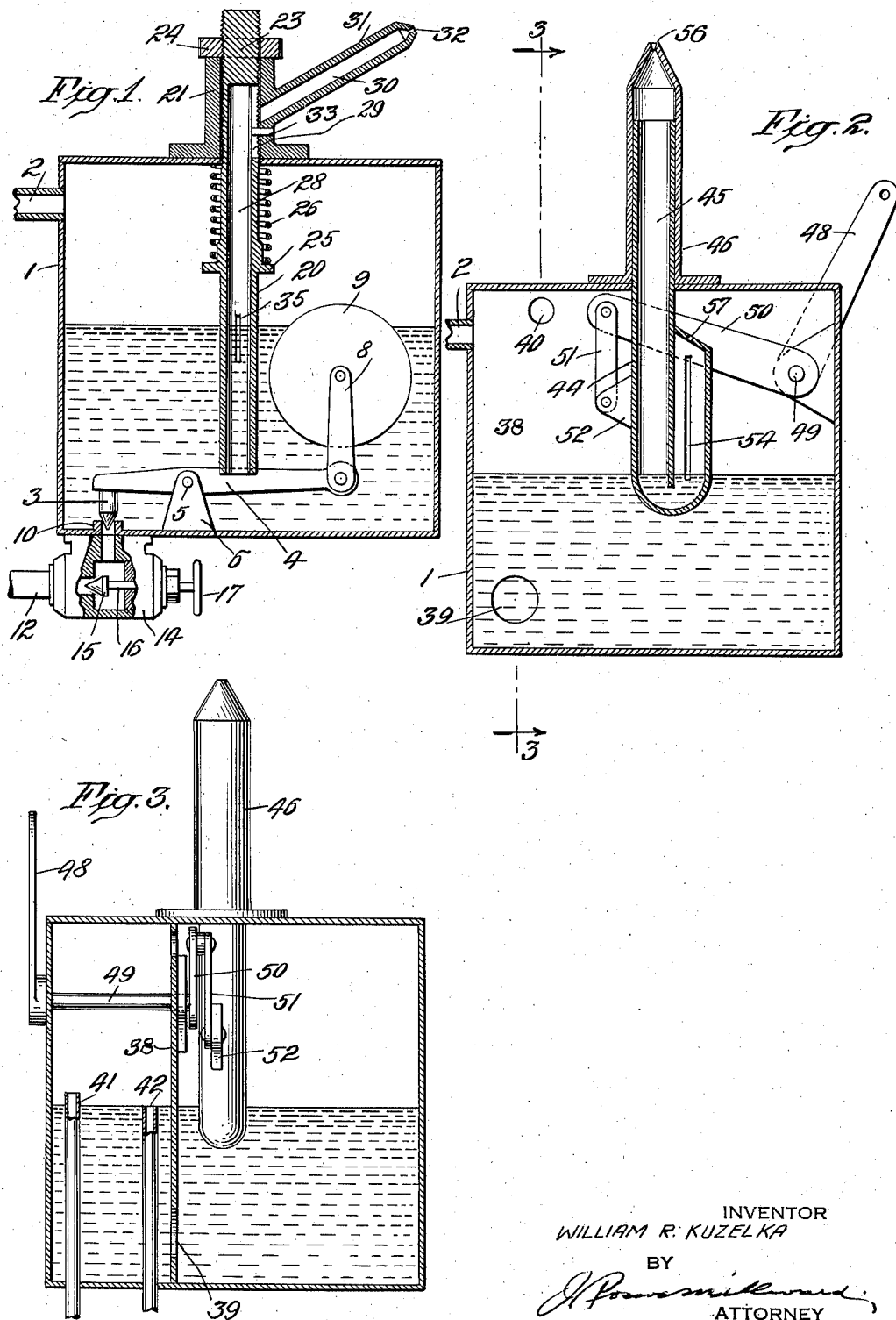
Dec. 6, 1938.

W. R. KUZELKA

2,139,506

ATOMIZING DEVICE

Filed April 18, 1936



INVENTOR
WILLIAM R. KUZELKA

BY

J. Powermillward
ATTORNEY

UNITED STATES PATENT OFFICE

2,139,506

ATOMIZING DEVICE

William Richard Kuzelka, New York, N. Y.

Application April 18, 1936, Serial No. 75,127

10 Claims. (Cl. 299—89)

The present invention relates to improvements in atomizing devices adapted to effect the vaporization of liquids in an improved manner permitting more accurate adjustment and control of the vaporization whereby a greater degree of uniformity in the dispersion and distribution of the liquid is insured. My improved device is adapted for varied uses wherein facility of control and uniformity in the atomization of the vaporized liquid is desired, such as in carburetors, oil burners, and sprayers for varied purposes.

Important features of the present invention which contribute to the improved action of the device consist of an atomizer construction including a suitable container which may have provision for maintaining a constant level therein of the liquid to be atomized and having a chambered injector member positioned to be partially immersed within the liquid and having communication with the usual spray nozzle, the injector member having an elongated injector opening or port for admitting air or other fluid under pressure as an impelling medium or liquid carrying vehicle; the arrangement further providing for relative adjustment of the injector member with relation to the liquid level for regulating the degree of vaporization of the liquid discharge. In the preferred embodiment, means are provided for raising and lowering of the injector member within the container and liquid and operable externally of the container to facilitate the adjustment without interruption to the spraying operation.

The foregoing and other important features and advantages of my present improvements will be more fully understood by reference to the accompanying drawing wherein like reference characters are applied to the corresponding parts in the several views. In the drawing, Fig. 1 is a view in vertical section showing a desirable atomizer construction made in accordance with my invention. Fig. 2 is a similar view showing a desirable modification thereof. Fig. 3 is a vertical sectional view of the construction of Fig. 2 taken at right angles thereof.

In the drawing wherein I have shown an approved embodiment of the several features of my improvements 1 indicates a suitable container for the liquid to be atomized and sprayed having at 2 an intake port for fluid under pressure such as air from a compression chamber to be employed as the impelling force and carrying vehicle for the vaporized liquid. Means are provided for maintaining a constant level of the

liquid within the container which is here shown in the form of a needle valve 3 carried upon lever 4 fulcrumed at 5 upon a bracket 6 and having pivotal link connection 8 to a float member 9. The valve 3 coacts with a valve seat 10 of a bottom intake port for the liquid supply delivered from a suitable source or tank through connection 12 through valve member 14 having additional control valve 15 mounted upon a threaded spindle 16 provided with external adjusting member 17. The latter valve, as will be understood, is employed to check the intake flow of the liquid and for shutting off of the liquid supply when desired.

In accordance with my invention as illustrated in Fig. 1 there is provided an injector member 20 of tubular link form and positioned vertically to extend through a bearing bracket 21 secured to the top of the container, the injector member having a closed upper threaded end portion 23 to which is fitted an adjusting nut 24 bearing upon the upper surface of the bracket 21. The injector member is further formed with an annular shoulder 25 engaged by a compression spring 26 bearing upon the inner surface of the tank to exert a downward pressure on the member whereby adjustment of the nut 24 will determine the vertical position of the member with relation to the liquid. The injector is further formed with a vertical and longitudinal central bore or passage opened at its lower end into the liquid and forming above the liquid a chamber 28 communicating at its upper end portion through a vertical side slot 29 with the bore or passage 30 of the discharge nozzle 31 having a metered opening 32 for the dispersion of the liquid. The nozzle 31 as shown is formed integral with the bracket 21 and the latter carries an inwardly extending pin 33 received within the elongated slot 29 to oppose rotative movement of the injector member or tube 20.

In accordance with an important feature of my invention the injector effect and atomization of the liquid is caused to occur at the liquid level, this being accomplished by the provision of a vertically elongated, metered slot or duct 35 formed in the side wall of the injector tube for the entrance of the air under pressure to pass upwardly through the otherwise closed chamber portion 28 and outwardly through the nozzle as will be understood. Adjustment of the nut 24 in the structure as described will cause vertical change in the position of the injector member thereby altering the degree of immersion of the metered duct 35 within the liquid with corresponding adjustment of the exposed portion of the slot thereabove. As a result there is provided

means for accurately determining the degree of atomization of the liquid which by reason of a constantly maintained liquid level will have an improved degree of uniformity as related to the liquid or vapor content, this uniformity of vapor discharge being furthered by the precipitation of liquid in the upward passage of the fluid through the vertical chamber 28 in its travel to the discharge nozzle. As will be understood with a constant air pressure and maintained liquid level, adjustment in the elevation of the injector tube 20 will accurately control the degree of atomization and resultant vapor content of the discharge through the nozzle 31 which while shown integral with the bracket 21 may, if desired, be connected to the bracket by a suitable flexible hose connection.

In Figures 2 and 3 there is shown a desirable modified structure embodying the features of my invention. As there shown 1 indicates, the container having the air intake port 2. The container is provided with a vertical partition 38 to provide a double chamber, the partition being formed with a lower opening 39 for maintaining equal the liquid level within the chambers and with an upper opening 40 for equalization of the air pressures therein. The means for maintaining a constant liquid level is positioned within the smaller chamber as shown and consists of liquid intake pipe 41 and discharge pipe 42 of slightly lesser elevation, the upper discharge end of which determines the level of the liquid. The injector member 44 is in the form of a U shaped tube having an upward extension 45 slidably fitted within a discharge nozzle bracket member 46 secured upon the container. The injector member is arranged to be adjustable vertically therein by means of an external lever 48 mounted on a shaft 49 carrying arm 50 connected by pivotal link 51 to a bracket 52 on the injector member.

The shorter leg of the injector tube is, as shown, formed with an elongated vertical slot 54 extending below the liquid level for admitting liquid within the bottom portion of the injector tube and for the admission of air as an atomizing agent and carrier for the vapor in its passage upwardly through the tube to the discharge port 56 of the nozzle. The upper closing wall of the short leg of the tube is provided with a restricted air opening 57 supplementing the air intake to the injector tube. In this modified construction as described a limited volume of the liquid is entrapped in the bottom of the injector tube through which the atomizing fluid is forced to pass in its travel to the nozzle.

While I have shown and described approved embodiments of the features of my invention, it will be understood that varied modifications in construction and arrangement of the parts may be made without departing from the scope of the invention as defined in the appended claims.

Having described my invention, I claim:

1. An atomizing device of the character described comprising a container, means for maintaining a constant level of liquid within the container, means to introduce fluid under pressure to the container to effect the atomizing of the liquid, an injector member having an internal chamber and provided with an elongated intake slot thereto positioned to extend above and into the liquid, means to adjust the position of the injector member relative to the liquid level and a discharge nozzle having a reduced outlet open-

ing directly communicating with the injector member chamber.

2. An atomizing device of the character described comprising a container, means for maintaining a constant level of the liquid in the container, means to introduce air under pressure to the container for atomizing the liquid, a chambered injector member positioned to extend externally of the tank and into the liquid and provided with a vertically elongated intake slot positioned to extend above and into the liquid, means for manually adjusting the position of the injector member to vary the degree of immersion of the slot in the liquid and a discharge nozzle having a reduced outlet opening directly communicating with the injector chamber.

3. An atomizing device of the character described comprising a container, means for maintaining a constant level of liquid within the container, means to introduce fluid under pressure to the container, an injector member consisting of a tube of U formation having an upwardly extending leg member, a bearing member on the container within which the upwardly extended leg member is slidably fitted, said injector tube having a shorter leg member provided with an elongated air intake slot extended above and into the liquid and means for adjusting the position of the injector member with relation to the liquid level.

4. An atomizing device of the character described comprising a container, means for maintaining a constant level of liquid within the container, means to introduce air under pressure to the container, an injector member consisting of a tube of U formation having an upwardly extending leg member, a tubular bearing and nozzle member on the container within which the upwardly extended leg member is slidably fitted, said injector tube having a shorter leg member provided with an elongated air intake slot extended above and into the liquid and means for adjusting the position of the injector member consisting of a shaft journaled on the container, an external lever on the shaft, an arm on the shaft within the container and a connecting link pivotally connected to said arm and to the injector member, substantially as described.

5. An atomizing device of the character described comprising a container, means for supplying liquid to said container, means to introduce fluid under pressure into the container to effect the atomizing of the liquid, an injector member having an internal chamber and provided with intake means from the container to the chamber, said intake means having an effective length longitudinally of said injector member in substantial excess of its width and positioned to extend above and below the level of the liquid in the container, means to adjust the intake means relative to the liquid level and a discharge nozzle having a reduced outlet opening directly communicating with the injector member chamber.

6. An atomizing device of the character described comprising a container receiving liquid, means for introducing a gaseous fluid under pressure into said container to effect a sufficient pressure to cause the atomizing of the liquid, an injector member having an internal chamber and provided with intake means from the container to said chamber, said intake means extending above and below the level of the liquid in said container, and means enabling manual adjustment of said intake means relative to the liquid

level whereby the degree of atomization may be regulated and a discharge nozzle having a reduced outlet opening directly communicating with the injector member chamber.

- 5 7. An atomizing device of the character described comprising a container receiving liquid, means for introducing a gaseous fluid under a sufficient pressure into said container to effect the atomization of the liquid, a U-shaped injector member having an internal chamber, a discharge nozzle for one of the legs of the U-shaped injector member, the other leg being provided with intake means from the container to said chamber, said intake means having an effective length 10 longitudinally of said injector member in substantial excess of its width and positioned to extend above and below the level of the liquid in said container, and means to adjust the relative position of said intake means and the liquid level.
- 20 8. An atomizing device of the character described comprising a container receiving liquid, means to introduce a gaseous fluid under pressure into said container to effect the atomization of the liquid, a U-shaped injector member having an internal chamber, a discharge nozzle for one of the legs of said U-shaped injector member, the other leg being provided with intake means having an opening extending above and below the level of the liquid in said container and means 25 enabling manual adjustment of said intake means relative to the liquid level whereby the degree of atomization may be regulated and a discharge nozzle having a reduced outlet opening directly communicating with the injector member chamber.
- 30 9. An atomizing device of the character described comprising a container receiving liquid, means to introduce a gaseous fluid under pressure for atomizing, a tubular injector member

having an upper threaded portion and an extension downwardly into the liquid, said injector member having an internal chamber open to the liquid and having an elongated fluid intake slot to the chamber, the slot being positioned to extend above and into the liquid, means for adjustably supporting the injector member consisting of a sleeve on the container having a bearing opening for the threaded injector portion, an adjusting nut threaded on the injector member and bearing on the bracket, a spring engaging the injector member to exert a downward pressure thereon, a discharge nozzle connected to an opening in said sleeve and said injector member having an elongated slot communicating with the chamber thereof and registering with the sleeve opening. 5 10 15

10. An atomizing device of the character described comprising a container receiving liquid, means for maintaining constant level of liquid within the container, means for introducing air under pressure to the container, a tubular injector member having an upper threaded portion and extended downwardly into the liquid, said injector member having a bore chamber open to the liquid and having an elongated fluid intake slot to the chamber, said slot being positioned to extend above and into the liquid, means for adjustably supporting the injector member consisting of a sleeve on the container having a bearing opening for the threaded injector portion, an adjusting nut threaded on the injector member and bearing on said sleeve, a discharge nozzle connected to an opening in said sleeve and said injector member having an elongated slot communicating with the chamber thereof to register with the sleeve opening and a pin carried by the bracket engaging said slot. 20 25 30 35

WILLIAM RICHARD KUZELKA.