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A. AKESON.

FEED DEVICE FOR HYDROCARBON BURNERS

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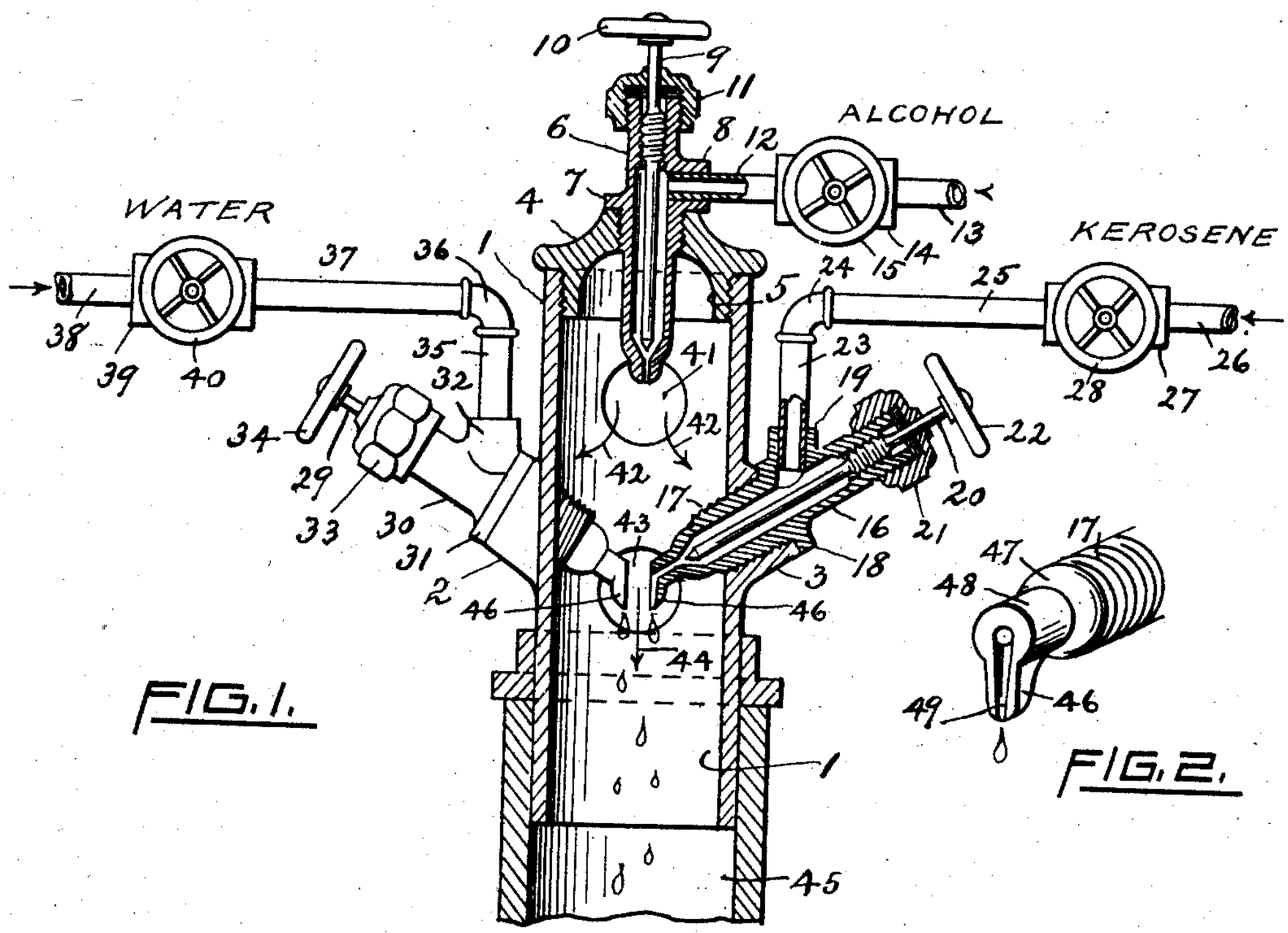

FIG. 1.

FIG. 2.

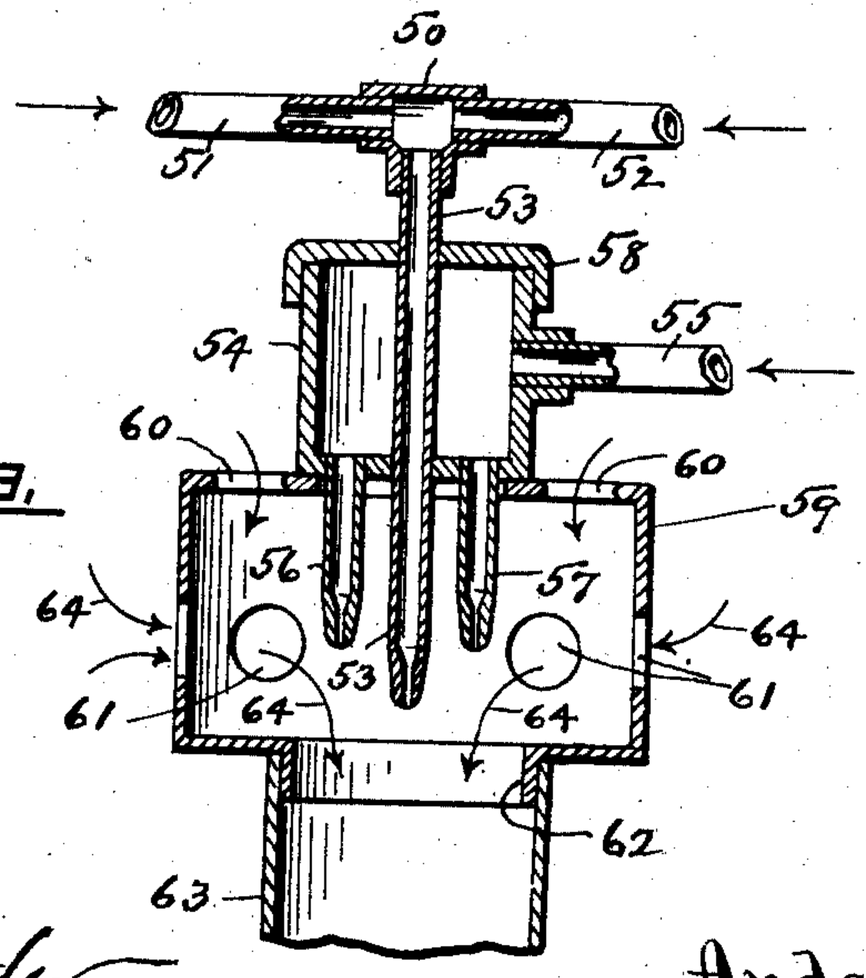

FIG. 3.

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FEED DEVICE FOR HYDROCARBON-BURNERS.

No. 883,374. Specification of Letters Patent. Patented March 31, 1908.

Application filed June 14, 1907. Serial No. 379,073.

To all whom it may concern:

Be it known that I, ANDERS AKESON, a citizen of the United States, residing at the city of Worcester, county of Worcester, and State of Massachusetts, have invented certain new and useful Improvements in Feed Devices for Hydrocarbon-Burners, of which the following is a specification.

My invention relates to hydrocarbon burners for heating and other purposes, and it consists of the novel construction, combination and arrangement of parts, as hereinafter described and claimed.

The object of my invention is to improve the feed devices for supplying liquid fuels to the vaporizing chamber of such burners, drop by drop, by gravity.

In the accompanying drawings like reference numerals indicate like parts.

Figure 1 is a central vertical section of my improved feed device for a hydrocarbon burner. Fig. 2 is an enlarged view in perspective of the dropper or discharging end of one of the needle valve tubes or cases, constituting one feature of my invention, and, Fig. 3 is a central vertical section of a modified form of the feed device for hydrocarbon liquids.

My invention is a modified form of the feeding device shown and described in my pending application for Letters-Patent of the United States, filed June 11, 1907, Serial No. 378,460.

A feed tube 1 is internally threaded at its upper end and has two angularly inclined bosses 2 and 3, each tapped with a screw-thread, as shown in Fig. 1. The upper end of the tube 1 is closed by a plug 4, having a screw-threaded central aperture at its upper end, and an annular shoulder or flange 5 of smaller diameter at its lower end, which is adapted to enter and engage with the upper end of the tube 1.

A valve tube or cylindrical valve case 6, by means of an exterior screw-thread, engages the central aperture of the plug 4, and has a flange 7, which is in snug contact with the upper surface of said plug. It also has the branch or tube 8 extending therefrom on one side. A needle valve 9 is operated by a handle or wheel 10, and moves spirally in the valve tube or case 6 by means of a screw-thread on the shank of said valve, which engages with a threaded portion of the bore of said tube or case, which portion of the bore is slightly reduced in diameter.

The lower end of the valve tube or case 6 has its bore conically reduced to a very small diameter, as seen in Fig. 1, and so furnishes a valve seat for the conical end of the needle valve when the latter is closed. The upper end of the valve tube or case 6 has an exterior screw-thread, upon which a screw-threaded cap 11 fits, the latter being made with a central aperture or bore, through which the shank of the needle valve 9 passes rotatably.

A pipe 12 is secured within the tubular projection or boss 8 of the valve case or tube 9. A pipe 13 conducts alcohol from a tank or reservoir, not shown. A valve 14 is located between the contiguous ends of the pipes 12 and 13, and is operated by a wheel 15.

A valve tube or case 16 has an exterior screw-thread 17, by which it is secured in position in the threaded boss 3. The valve tube or case 16 has a flange 18 in contact with the outer end of the boss 3. It also has a tube or branch 19 on its upper side. It is screw-threaded in a portion of its bore, which is there somewhat reduced in diameter. A needle valve 20 is mounted in the valve tube or case 16, and has a portion of its shank screw-threaded to engage with the threaded portion of said bore, as seen in Fig. 1. The outer end of the valve tube or case 16 is exteriorly threaded and a threaded screw cap 21 engages therewith to close the outer end of the valve tube or case.

The screw cap 21 has a central aperture or bore through which the shank of the needle valve 20 passes rotatably. The needle valve 20 is operated by a hand wheel 22. The lower portion of the bore of the valve tube or case 16 is reduced conically, as shown in Fig. 1, to have a very small diameter, and so furnishes a valve seat for the conical end of the needle valve 20, when the latter is closed. The valve tube or case 16 terminates in a grooved, downwardly extending lip or dropper, which is hereinafter more fully described.

A pipe 23 is fitted in the tubular boss or branch 19 and is connected by an elbow 24 with a pipe 25. A pipe 26 conducts kerosene from a tank or reservoir, not shown. A valve 27 connects the contiguous ends of the

pipes 25 and 26 and is operated by the hand wheel 28. A similarly constructed needle valve 29, valve tube or case 30 having a flange 31, a tubular boss 32, and screw cap 33, is mounted and supported in the threaded boss 2 of the feed tube 1. The needle valve 29 is operated by the hand wheel 34.

A pipe 35 fits in the tubular boss 32 and is connected by an elbow 36 to a pipe 37. A pipe 38 conducts water from a tank or reservoir, not shown. A valve 39 connects the contiguous ends of the pipes 37 and 38 and is operated by the hand wheel 40.

The feed tube 1 has an air inlet 41, substantially in line with the discharging end of the valve tube 6, and the arrows 42 indicate air currents entering the tube 1 through said inlet. Said tube 1 also has an air inlet 43, substantially in line with the discharging ends of the valve tubes or cases 16 and 30, and the arrow 44 indicates the air current entering the feed tube 1 through the inlet 43. The vaporizing tube or chamber 45 is shown only in its upper portion, which receives the lower end of the feed tube 1.

A characteristic feature of my invention is the elongated, grooved lip or projection 46, which may be called the "dropper". This is shown in Fig. 1 in elevation on the left hand and in central longitudinal section on the right hand of said figure, and also in perspective on an enlarged scale in Fig. 2. The valve tube or case (designated as 16 in Fig. 1) has the screw-threads 17 and the convex end 47, from the outer portion of which latter is an integral tubular projection 48. The dropper 46 extends integrally from the projection 48 at one side and is directed at an angle downwardly. It has a longitudinal groove 49, semi-circular in cross-section. The groove 49 is continuous with the bore of the tubular projection 48 and with the bore of the valve tube or case. The angle of the dropper 46, in relation to the projection 48, is such that the grooved face of the dropper 46, when the whole device has been assembled and is set in a perpendicular direction, is vertical, as shown in Figs. 1 and 3. The fluid contents of the valve tube or case flow out along the channel or groove 49 and drip from the lower end of the dropper 46, as illustrated in the drawings.

The operation of the said improved feeding device is as follows: When a blaze has been started in the combustion chamber (not shown), which is at the bottom of the vaporizing tube or chamber 45, the air of the external atmosphere rushes in through the air inlets 41 and 43 of the feed tube 1, as indicated by the arrows 42 and 44, thus producing a strong down draft through the vaporizing tube or chamber 45, as is well understood in this art without further explanation. Alcohol is first fed in by turning the valve wheel 15 and the same is discharged through the valve 6, by operating the valve wheel 10 to withdraw the end of the needle 9 from its seat. Thus alcohol is reduced more or less to spray by means of the air currents through the inlet 41, indicated by the arrows 42. Kerosene is then admitted to the valve tube or case 16 by turning the valve wheel 28. The valve wheel 22 is then operated and the needle valve 20 is unseated, whereupon the kerosene flows into the channel or groove 49 of the dropper 46, and falls from the end of the latter in a succession of drops, as illustrated in Fig. 1, which descend along the feed tube 1. Similarly, the operation of the valve wheel 40 and of the valve wheel 34 causes water to pass through the valve 30 and to be discharged in drops into the feed tube 1. The droppers of the valve cases 16 and 30 are located adjacent to the air inlet 43, through which the air is rushing in a strong downward draft, as indicated by the arrow 44. The air currents coming in at the inlets 41 and 43 dissipate the drops of kerosene and of water and subdivide them into smaller globules or masses of spray, which are mingled in the vaporizing tube or chamber 45, and pass into the combustion chamber (not shown), where the oil becomes a vapor that may be readily ignited.

In Fig. 3 is shown a modified form of my said improved feeding device. A T-shaped union or pipe 50 supports at one upper end an alcohol feed pipe 51, and at the other upper end a water feed pipe 52, and at the lower end a discharge pipe 53. An oil tank 54 receives a kerosene feed pipe 55, and has two discharge pipes 56, 57. Said tank has a cover 58, provided with a central orifice, through which the discharge pipe 53 passes, and the pipe 53 also passes through the bottom of the tank 54. A combined air-drum and mixing chamber 59 has air inlets 60, 61, and is provided on its upper side with a central opening, through which opening the discharge pipes 53, 56, and 57 pass, the lower end of the pipe 53 extending a little below the lower ends of the pipes 56 and 57. The air-drum or mixing chamber 59 has a central aperture and collar 62 at the bottom, and the upper end of the vaporizing tube or chamber 63 is held by the collar 62, as illustrated in Fig. 3. It is thus seen that the fluids discharged into the chamber 59 from the pipes 53, 56 and 57, are immediately subjected to and broken up by the strong downward air currents through the air inlets 60, 61, as indicated by the arrows 64, and so are vaporized in the upper portion of the tube or chamber 63.

I claim as a novel and useful invention and desire to secure by Letters-Patent:—

In a feed device for a hydrocarbon burner, the combination of a vaporizing chamber; a

feed tube communicating with said chamber and provided with air inlets; a needle valve adapted to discharge alcohol into said tube; a needle valve adapted to discharge water into said tube, and said latter valve having a nozzle which terminates in a radially disposed dropping point capable of discharging the liquid from said valve in drops by gravity; and a needle valve adapted to discharge kerosene into said tube, and said valve having a nozzle which terminates in a radially disposed dropping point capable of discharging the liquid from said valve in drops by gravity.

In testimony whereof I affix my signature in presence of two witnesses.

ANDERS AKESON.

Witnesses:

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