

No. 677,755.

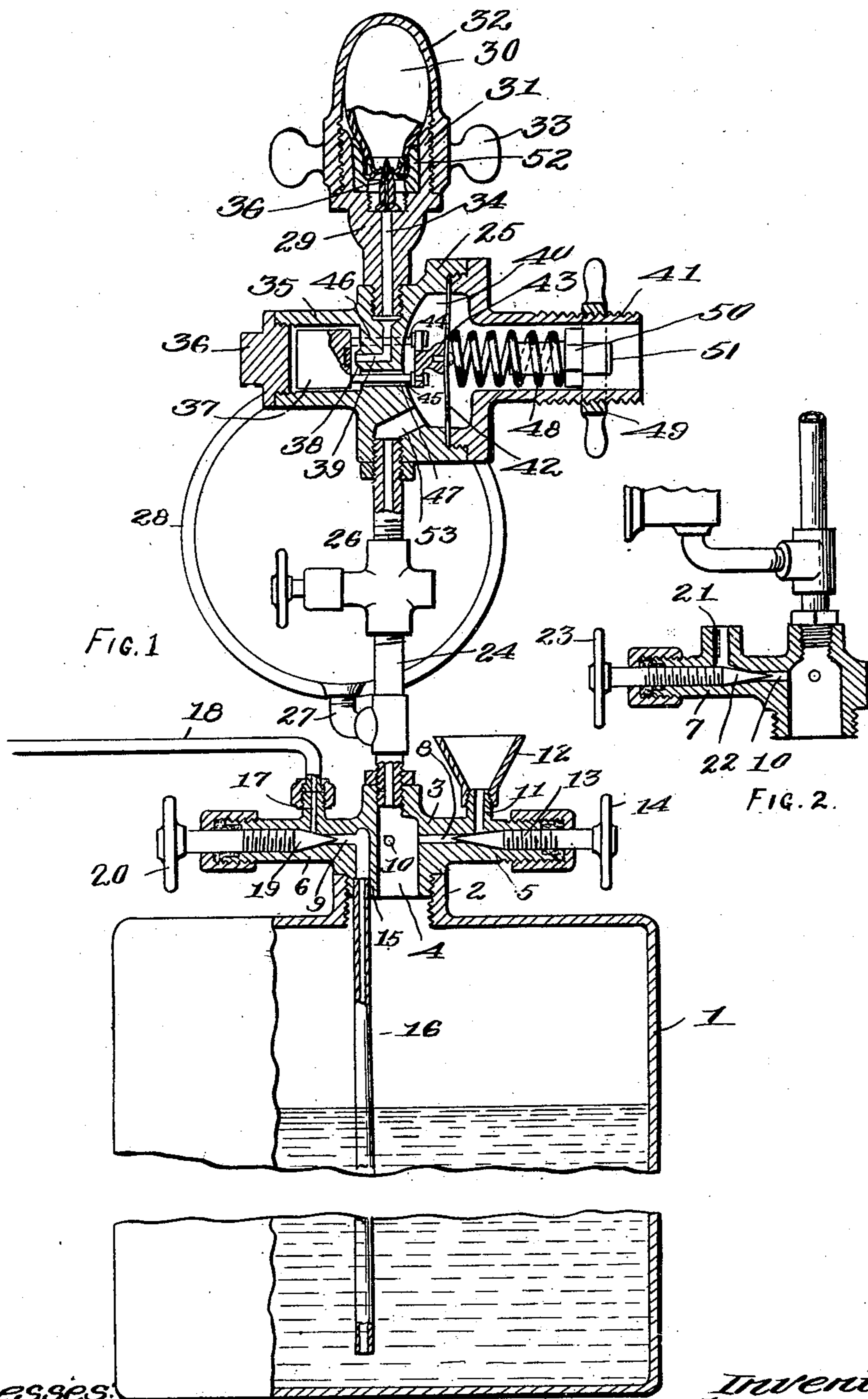
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J. G. BRANCH.

APPARATUS FOR DISTRIBUTING OR FEEDING COAL OIL OR OTHER HYDROCARBONS.

(Application filed Sept. 27, 1900.)

(No Model.)



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# UNITED STATES PATENT OFFICE.

JOSEPH G. BRANCH, OF ST. LOUIS, MISSOURI.

APPARATUS FOR DISTRIBUTING OR FEEDING COAL-OIL OR OTHER HYDROCARBONS.

SPECIFICATION forming part of Letters Patent No. 677,755, dated July 2, 1901.

Application filed September 27, 1900. Serial No. 31,175. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH G. BRANCH, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented new and useful Improvements in Apparatus for Distributing or Feeding Coal-Oil or other Hydrocarbons, of which the following is a specification.

My invention relates to apparatus for distributing or feeding coal-oil and other like hydrocarbons for lighting and heating purposes, one object of the same being to provide means whereby the pressure for feeding the oil may be conveniently applied and controlled.

A further object of the invention is to provide means whereby a constant and uniform pressure may be applied to the hydrocarbon liquid for the purpose of feeding the same in a constant and uniform stream to the burners.

Other objects of the invention will hereinafter appear, and the novel features thereof will be set forth in the claim.

In the drawings forming part of this specification, Figure 1 is a vertical sectional view of an apparatus constructed according to my invention. Fig. 2 is a detail vertical sectional view through the valve-casing on the upper end of the tank or reservoir, the section being taken at right angles to Fig. 1.

Like reference-numerals indicate like parts in both views.

The tank or reservoir 1 for containing the coal-oil or other hydrocarbon is formed with an internally-screw-threaded neck 2 upon its upper end, into which is screwed the valve-casing 3, having a central chamber 4 therein which communicates with the tank 1. The casing 3 is provided with three laterally-projecting nipples or extensions 5, 6, and 7, respectively, each communicating through the ports 8, 9, and 10 with the chamber 4. On the nipple 5 is formed an upwardly-extending filling-nozzle 11, having a funnel-shaped mouth 12, and controlling the passage between the nozzle 11 and the port 8 is a needle-valve 13, the stem of which is provided with an operating-handle 14. The port 9 in the nipple 6 communicates with a duct 15, formed in the casing 3 on one side of the chamber 4, in which duct is secured a pipe 16, which leads down into the tank 1 and terminates adjacent to the lower end of said

tank. A vertical passage 17 in the nipple 6 communicates with a service-pipe 18, leading off to the burners or other points to which the coal-oil is to be conveyed. The passage between the ports 9 and 17 is controlled by a needle-valve 19, having a handle 20 thereon similar to the valve 13 and handle 14, heretofore referred to. The nipples or extensions 5 and 6 preferably extend in opposite directions from each other, and between said nipples 5 and 6 the nipple 7 is located, the latter preferably extending at right angles to the nipples 5 and 6. In the nipple or extension 7 is a vent-orifice 21, and the passage between said orifice and the port 10 is controlled by a needle-valve 22, having an operating-handle 23 upon its outer end.

Secured to the upper end of the valve-casing 3 and communicating with the central chamber 4 therein is a vertical pipe 24, to the upper end of which is secured the casing 25 of a reducing or pressure-controlling valve. In the pipe 24, below the casing 25, is a cock or cut-off 26, and leading from the pipe 24, below the cock 26, is a pipe 27, which communicates with a pressure-gage 28. Secured to the casing 25 of the reducing-valve is a hollow part 29, which serves as a support for a capsule 30, containing compressed carbonic-acid or other gas. The upper end of the support 29 is formed with an annular flange or neck 31, which is externally screw-threaded and adapted to receive a cap 32, having wings or ears 33 thereon, by means of which it may be turned. Located within the flange 31 and in line with the passage 34 through the support 29 is a pointed prong or pin 36, adapted to perforate a puncturable seal in the contracted neck of the capsule 30, and thereby relieve said capsule of its contents.

The casing 25 of the reducing-valve is formed with a lateral tubular extension 35 on one side, into the outer end of which fits a closing-plug 36. These two parts form a chamber in which is located a plug-valve 37, as clearly shown. The seat 38 for the valve 37 projects slightly into the hollow extension 35, and through this valve-seat leads a port 39, which communicates with the passage 34 in the tubular support 29. The casing 25 on the side opposite the extension 35 is formed with an enlarged chamber 40 and has an ex-

ternally-screw-threaded extension 41 thereon. In the chamber 40 is secured a diaphragm 42, connected with a bracket 43, which bracket is in turn connected with the valve 37 by means of the rods 44 45, extending through ports 46 47, leading from the inside of the extension 35 to the chamber 40. The outer side of the diaphragm 42 is acted upon by a coil-spring 48, whose tension may be controlled by means of a ring-nut 49, engaging the external threads on the extension 41. The connection between the nut 49 and the spring 48 is by way of a cross-head provided with lateral arms 50, which project through elongated slots 51 in the extension 41 and are engaged by the ring-nut 49.

Constructed as above described the operation of my apparatus is as follows: The tank 1 is first filled with coal-oil or other liquid hydrocarbon up to a level slightly below the top of said tank. To fill the tank, the cock 26 is turned so as to cut off communication between the pipe 24 and said tank. The needle-valve 19 is also turned to its closing position, while the needle-valves 13 and 22 are opened. Coal-oil or other liquid hydrocarbon is now poured into the funnel 12, the same passing through the passage in the filling-spout 11 down through the port 8 and the chamber 4 into the tank. Air above the liquid in the tank or any vapor that may exist or be generated, may pass off through the vent 21. When the tank has been filled to the proper height, the needle-valves 13 and 22 are returned to their closing positions. The apparatus is now ready to have pressure applied to it for the purpose of feeding the coal-oil to the burners. This pressure is supplied, as heretofore indicated, by a capsule 30, containing carbonic-acid or other gas under a high pressure. To apply one of these capsules, the cap 32 is removed and the capsule is inserted into the upper end of the tubular support 29, with its contracted neck held in place between the walls of a rubber or other gasket 52, lying within the flange 31. In this position of the capsule the puncturable seal thereof is directly above the pointed prong or pin 36. The cap 32 is now reapplied and screwed down upon the flange 31 of the support 29. This action also forces down the capsule so as to bring the puncturable seal thereof into contact with the pointed end of the prong 36. When this is done, the said seal is broken and the compressed gas within the capsule is released. The same passes down around the pin 36 and into the passage 34. From the passage 34 it flows through the port 39 into the chamber containing the valve 37 and thence through the ports 46 47 into the enlarged chamber 40 of the reducing-valve. From the chamber 40 it passes through the port 53 into the pipe 24 and thence into the upper part of the tank 1 through the chamber 4. A portion of the same also passes through the pipe 27 into the gage 28, where a visual indication of the

pressure attained by the gas is shown. As heretofore stated, it is important that a constant and equal pressure be maintained in the tank 1 above the coal-oil in order that the feed of the same from the tank 1 to the burners may be constant and equal. It is for this purpose that the reducing-valve above described is employed. The pressure released from the capsule 30 is necessarily far in excess of that required in the upper part of the tank 1. When the gas passes from the capsule 30 through the port 39, the valve 37 opens and allows the gas to pass into the chamber 40 through the ports 46 and 47. As the area of the diaphragm 42, however, is much greater than that of the valve 37 it necessarily follows that said diaphragm will be forced outwardly or to the right, carrying with it the valve 37 and partially or entirely closing the valve 37. In this way the supply of gas into the chamber 40 is either very much cut off or entirely stopped. The outward movement of the diaphragm 42, however, is against the pressure of the spring 48. By adjusting the tension of said spring, therefore, the pressure of the gas passing through the chamber 40 and into the pipe 24 may be accurately controlled. As the gage 28 indicates the pressure in the pipe 24 it is obvious that if it be too high or too low or above or below that desired to be exerted upon the coal-oil in the tank 1 it may be accurately regulated by screwing the ring-nut 49 in one direction or the other on the extension 41. With the pressure satisfactorily adjusted the needle-valve 19 is opened and the coal-oil or other liquid hydrocarbon in the tank 1 is forced up through the pipe 16, duct 15, port 9, and passage 17 into the service-pipe 18, whence it is conveyed to the burners or other point where it is to be used.

It will be observed that by my invention, consisting of the adaptation of a compressed-gas capsule to a coal-oil-distributing apparatus, I have devised an extremely simple and convenient means of obtaining power for feeding the coal-oil from a storage-tank to the burners where it is to be utilized. This is of an especial importance in individual or isolated house systems, where other means of obtaining power for feeding the coal-oil would be too expensive or inconvenient. Furthermore, by my apparatus I am enabled with an initial pressure of, say, several hundred pounds to the square inch to obtain a perfectly even and constant pressure upon the coal-oil in the tank of, say, forty pounds to the square inch. This is a matter of extreme importance, as it provides for a constant and regular feed of the oil to the burners.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

In a hydrocarbon distributing or feeding apparatus, the combination with a tank having a screw-threaded neck upon the upper end thereof, of a valve-casing screwed upon said neck having a central chamber therein, a duct

on one side of said chamber, and a plurality of laterally-extending nipples, one of which communicates with said duct and the others of which communicate with said chamber, a  
5 pipe communicating with said duct, leading downwardly therefrom and terminating at a point adjacent to the bottom of said tank, a service-pipe leading from the nipple which communicates with said duct, a valve controlling the passage from said duct to said  
10 service-pipe, the other nipples having respectively filling and vent openings therein and valves controlling the passages from said filling and vent openings to said tank, a vertically-disposed pressure-supply pipe upon  
15 the upper end of said valve-casing communicating with the central chamber in said casing, a cut-off cock in said pressure-supply

pipe and a pressure-gage communicating with said pipe, a reducing-valve at the upper end 20 of said pressure-supply pipe, a tubular support for a compressed-gas capsule upon the upper end of the casing of said reducing-valve and communicating therewith, puncturing means for said capsule in the passage 25 through said support and a cap screwing upon said support for forcing a capsule down into contact with said puncturing means, as and for the purpose set forth.

In testimony whereof I have hereunto set 30 my hand in presence of two subscribing witnesses.

JOSEPH G. BRANCH.

Witnesses:

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