

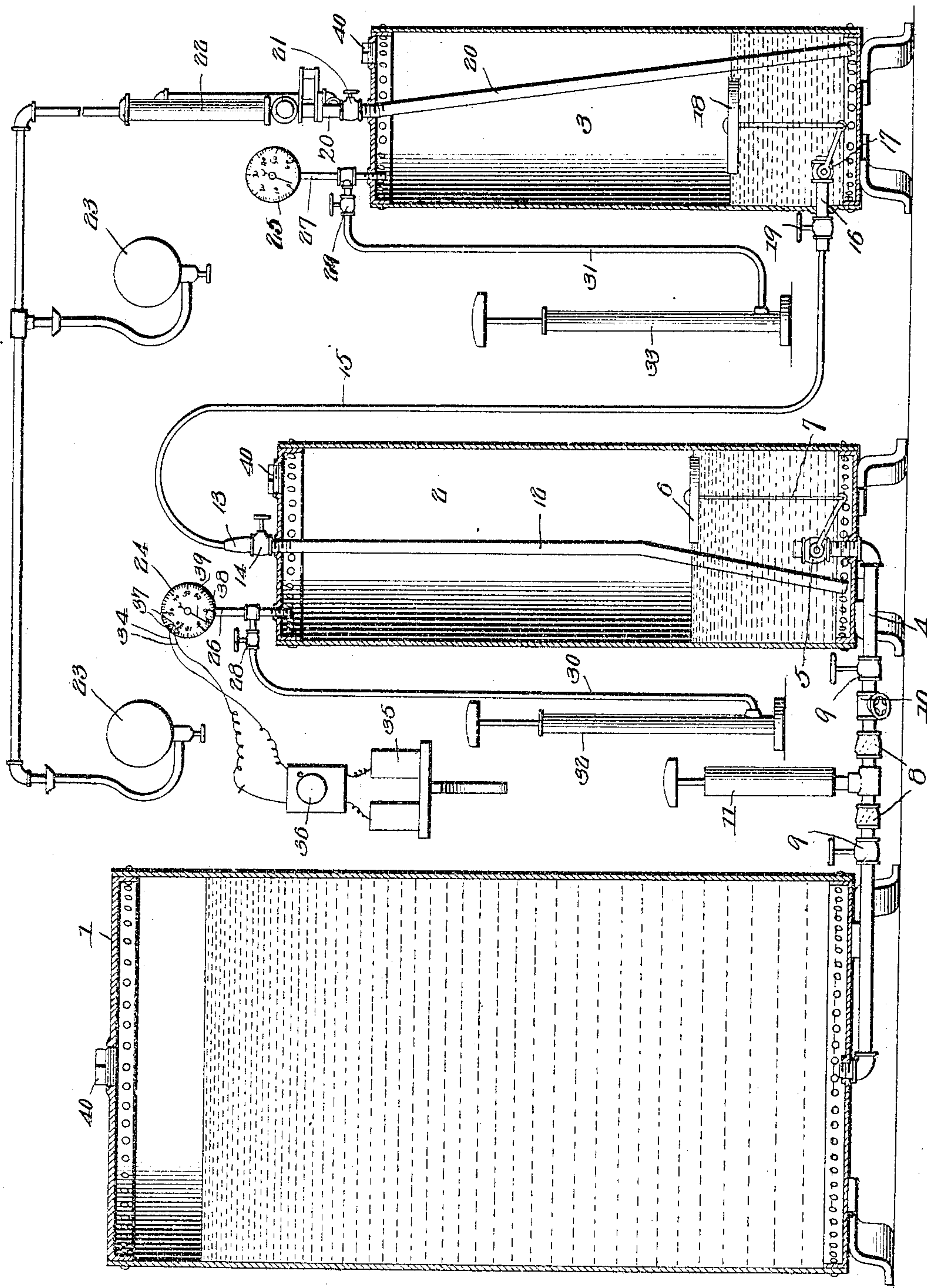
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N. P. FRASER.

DEVICE FOR FEEDING HYDROCARBON TO VAPOR BURNERS.

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Witnesses

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UNITED STATES PATENT OFFICE.

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DEVICE FOR FEEDING HYDROCARBON TO VAPOR-BURNERS.

SPECIFICATION forming part of Letters Patent No. 788,039, dated April 25, 1905.

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To all whom it may concern:

Be it known that I, NORMAN P. FRASER, a citizen of the United States, residing at Carsonville, in the county of Sanilac and State of Michigan, have invented a new and useful Device for Feeding Hydrocarbon to Vapor-Burners, of which the following is a specification.

This invention relates to devices for feeding hydrocarbon to vapor-burners; and it has among its objects to automatically regulate the flow of the hydrocarbon liquid, thereby insuring steady flames and the avoidance of flickering of the flames of the burners that are being used.

Another object is, by an automatic signal, to give notice when the supply of hydrocarbon is nearly exhausted.

The device is applicable to plants for the consumption of hydrocarbon-vapor in which the vapor for a plurality of burners is developed by a single generator.

The invention consists in the improved construction and novel arrangement and combination of parts to be hereinafter fully described, and particularly pointed out in the claims, whereby atmospheric pressure in the tank from which the hydrocarbon is delivered to the generator is maintained even and unchanged without regard to the consumption of hydrocarbon contained in said tank.

In the accompanying drawing has been illustrated a simple and preferred form of embodiment of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that the right is reserved to any changes, alterations, and modifications to which recourse may be had within the scope of the invention and without departing from the spirit or sacrificing the efficiency of the same.

The said drawing represents a vertical sectional view of a plant constructed in accordance with the principles of the invention.

1 designates a reservoir of any desired capacity. 2 and 3 designate air-tight tanks which may likewise be of any desired shape and capacity. A pipe 4 connects the lower

end of the reservoir 1 with an automatic valve 5 at the lower end of the tank 2, which latter is named the "pressure-tank." The closure of the valve 5 is effected automatically by the action of a float 6 within the tank, said float being connected with the valve by means of a connecting member 7 of any desired length. In the construction of the valve 5 no novelty is claimed, and said valve, which has been conventionally illustrated, may be of any suitable and well-known construction.

The pipe 4 is provided with check-valves 8 8, opening in the direction of the pressure-tank 2. Said pipe is also provided with stop-valves 9 9 adjacent to the reservoir and to the pressure-tank. A bib-cock 10 is disposed between the valve 9 adjacent to the pressure-tank and the adjacent check-valve 8, and a pump 11 is connected with the pipe 4 intermediate the check-valves. This pump, which consists simply of a cylinder and a piston mounted therein for reciprocation, may be utilized while the valves 9 9 are open to force the contents of the reservoir 1 into the tank 2. As it rises in the latter it causes the float 6 to rise, thereby presently causing the automatic valve 5 to be closed and preventing the admission of more fluid. When the tank 2 has been filled to the extent permitted by the automatic valve, the stop-valves 9 9 are closed, and fluid remaining in the pipe 4 may, if desired, be drained off through the bib-cock 10.

A pipe 12, extending nearly to the bottom of the tank 2, has in the top of said tank a connecting-plug 13, provided with a valve 14. The connecting-plug 13 is connected by a pipe, preferably a drawn-copper tube 15, with an inlet 16 near the lower end of the feed-tank 3, said inlet being provided with an automatic valve 17, regulated by a float 18. The inlet 16 also has a stop-cock 19. From the lower end of the feed-tank 3 a pipe 20, having a valve 21, leads to the generator 22, at which the liquid hydrocarbon is vaporized for the purpose of supplying burners, as 23.

The pressure-tank 2 and the feed-tank 3 are each provided with a pressure-gage 24 25, said pressure-gages being connected with the respective tanks by means of pipes 26 27.

Tubes 30 31, having valves 28 29, connect the pipes 26 27 with air-compressors 32 33, whereby air may be injected into the said tanks, the pressure being registered upon the gages or indicators.

The pressure-gage 24 of the pressure-tank is connected by electric conductors 34 with a battery 35, in the circuit of which is included the electromagnet of a signal-bell 36. The conductors 34 are provided with contacts 37, adapted to be connected by a contact 38, suitably connected with the hand or pointer 39 of the gage, which will thus close the circuit and cause the signal to be operated when the pressure in the tank has reached a predetermined point.

The several tanks are provided with plugs 40 for filling, cleaning, and the like.

In operation liquid hydrocarbon, such as gasolene, contained in the reservoir 1 is pumped from said reservoir into the pressure-tank until by the action of the float 6 the valve 5 is automatically closed, after which the stop-cocks 9 are closed. The air-compressor 32 is then operated to inject air into the pressure-tank until a pressure of, say, thirty pounds has been attained, the valve 14 being meanwhile closed. When the desired pressure has been attained, the valve 28 is closed and the valve 14 is opened, when the hydrocarbon contained in the pressure-tank will be brought through the pipe 15 into the feed-tank until the float 18 in the latter reaches a point at which the automatic valve 17 is closed. Air is now injected into the feed-tank until a pressure of, say, twenty pounds has been attained, after which the valve 29 is closed. The valves 9 9 are now again opened and the pump 11 is operated to inject hydrocarbon into the tank 2 against the pressure of the air contained in said tank until the normal pressure of, say, thirty pounds has been restored. Assuming this to be the normal pressure in the pressure-tank and assuming twenty pounds to be the normal pressure in the feed-tank, the contacts 37 should be so disposed that the electric signal will be actuated when the pressure in the pressure-tank approaches twenty pounds. The apparatus having been charged in the manner described is now ready for operation, and it is obvious that by simply opening the valve 21 the hydrocarbon will be permitted to flow to the generator, where in the usual manner it is converted into vapor to be supplied to the burners. As the contents of the feed-tank is gradually consumed, the lowering of the level will cause the float 18 to sink, thereby slightly opening the valve 17 and causing hydrocarbon to be forced or fed from the pressure-tank into the feed-tank, but only at the precise rate at which it is consumed, consequently maintaining in the feed-tank an absolutely constant and steady pressure, whereby the fluid will be fed with absolute regularity to the generator, always assuming,

of course, that there is no leakage of air from the tank. When the hydrocarbon contained in the tank 2 is lowered, with a consequent reduction of pressure, notice of the fact will be given automatically by the electric signal in ample time to enable the pressure-tank to be recharged.

Having thus described the invention, what is claimed is—

1. In an apparatus of the class described, a container constituting a feed-tank, means for maintaining a pressure of air in said tank, a generator, a valved pipe connecting the tank with the generator, a container constituting a pressure-tank, means for maintaining a pressure of air in said pressure-tank, an automatic valve in the feed-tank, a float within said tank operating said valve, and a pipe connecting the feed-tank with the pressure-tank.

2. In an apparatus of the class described, a container constituting a feed-tank, means for maintaining a pressure of air in said tank, a generator, a valved pipe connecting the feed-tank with the generator, a container constituting a pressure-tank, means for maintaining a pressure of air in the latter, means for forcing liquid into said tank against the pressure of air existing therein, an automatic valve constituting the inlet to said pressure-tank, a float operating said valve, an automatic valve in the feed-tank, a pipe connecting the latter with the pressure-tank, and a float within the feed-tank operating the automatic valve therein.

3. In an apparatus of the class described, a storage-tank, a pressure-tank and a feed-tank, means for injecting air into the pressure-tank and into the feed-tank, means for transferring the contents of the storage-tank to the pressure-tank against the pressure existing in the latter, an automatically-operated valve constituting a check against the injection of liquid into pressure-tank beyond a predetermined point, and means of communication between the pressure-tank and the feed-tank, said means including an automatically-operated valve adapted to close when the liquid in the feed-tank reaches a predetermined level.

4. In an apparatus of the class described, a feed-tank, a generator, valved means of communication between said feed-tank and generator, a pressure-gage connected with the feed-tank, means for maintaining a pressure of air in the latter, a pressure-tank, means of communication between the feed-tank and the pressure-tank, including an automatically-operated valve, means for maintaining a pressure of air in the pressure-tank, a pressure-gage connected with said tank, a storage-tank, means of communication between the pressure-tank and the storage-tank, including an automatically-operated valve, and pumping means for transferring the contents of the storage-tank to the pressure-tank through the automatically-operated valve.

5. In an apparatus of the class described, a container constituting a feed-tank, means for maintaining a pressure of air in said tank, a generator, a valved pipe connecting the tank
5 with the generator, a container constituting a pressure-tank, means for maintaining a pressure of air in the latter, communicating means between the pressure-tank and the feed-tank, including an automatically-operated
10 valve, a pressure-gage connected with the pressure-tank, an electrical circuit including

an electric bell and having contacts connected with the dial of the pressure-gage, and a circuit-closer connected with the pointer of said gage.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

NORMAN P. FRASER.

Witnesses:

WM. J. McCAREN,
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