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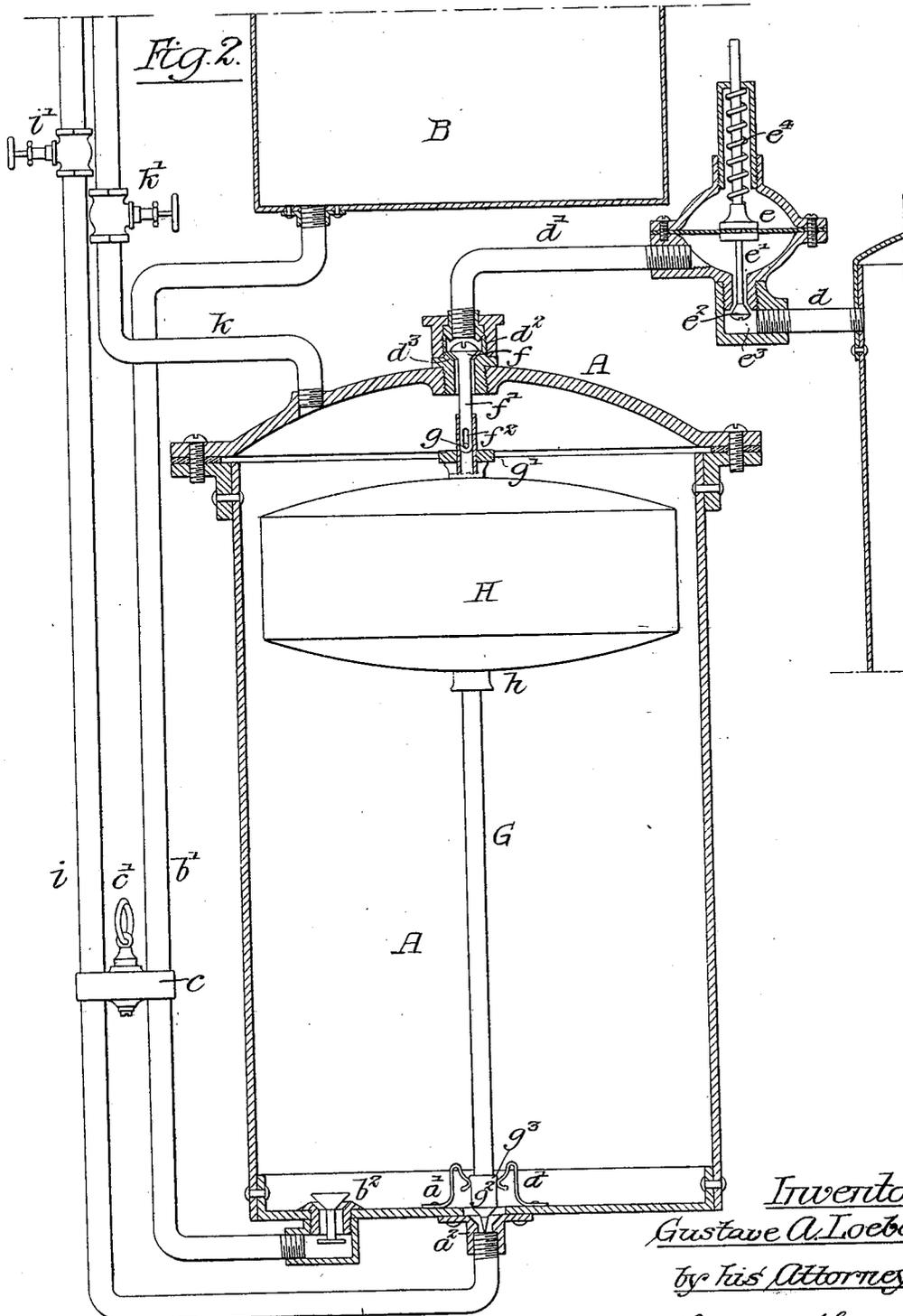
G. A. LOEBEN.

HYDROCARBON BURNER AND PRESSURE DEVICE THEREFOR.

(Application filed Oct. 21, 1899.)

(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

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HYDROCARBON-BURNER AND PRESSURE DEVICE THEREFOR.

SPECIFICATION forming part of Letters Patent No. 658,794, dated October 2, 1900.

Application filed October 21, 1899. Serial No. 734,380. (No model.)

To all whom it may concern:

Be it known that I, GUSTAVE A. LOEBEN, a subject of the Emperor of Germany, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Hydrocarbon-Burners and Pressure Devices Therefor, of which the following is a specification.

The main object of my invention is to produce the pressure necessary for forcing the hydrocarbon or other fluid to be vaporized or gasified by means of a fixed gas under pressure—such, for instance, as ordinary illuminating-gas—and to regulate this pressure.

A further object of the invention is to provide a tank or supplemental reservoir from which the fluid will flow automatically when the pressure in the main reservoir is reduced.

A still further object of the invention is to heat the burner by the gas used for creating pressure in the reservoir.

In the accompanying drawings, Figure 1 is a side view of my improved apparatus. Fig. 2 is an enlarged sectional view of the main reservoir and regulator, and Fig. 3 is a view of a modified form of valve used in the burner-supply pipe.

A is the main reservoir, and B is the tank or supplementary reservoir, having a filling-opening *b*, which is provided with a screw plug or cap. The supplementary reservoir is connected to the bottom of the main reservoir A through a pipe *b'*, and in the bottom of the said reservoir A is a check-valve *b²*, opening inward, so as to allow for the free flow of fluid from the supplemental reservoir B into the main reservoir A, but preventing the escape of fluid through this pipe from the reservoir A.

D is a container for fixed gas under pressure. This gas may be the ordinary gas either used for heating or illuminating. The container can be charged in any suitable manner.

E is a diaphragm-regulator, having a diaphragm *e*, and projecting from the diaphragm is a valve-stem *e'*, having at its lower end a valve *e²* within a chamber *e³*, which communicates with the container D through a pipe *d*. A spring *e⁴* tends to force the diaphragm down and the valve open. The space under the diaphragm in the regulator is connected to

the upper portion of the reservoir A through a pipe *d'*, being coupled to a fitting *d²*, in which is a valve-seat *d³*. *f* is a valve adapted to the seat *d³*. The stem *f'* of this valve has a slot *f²*, in which works a pin *g* on the stem G, extending from top to bottom of the reservoir A. This stem has a flange or collar *g'*, against which strikes a float H when it is raised to its full limit.

Connected to the bottom of the reservoir A is a pipe *i*, communicating with the lamp I, which may be of any of the ordinary forms of vapor-lamps in which oil or other burning fluid is vaporized or gasified.

In the bottom of the reservoir A is a valve-seat *a'*, and in the end of the stem G is a valve *g²*, which is adapted to close upon the seat *a'*. On each side of the stem are two or more springs *a'*, which are secured in the present instance to the bottom of the casing of the reservoir, and these springs hold the stem G in its raised position, resting under a shoulder *g³* on the stem, as shown in Fig. 2.

On the under side of the float H is a projection *h*, which when the float is lowered comes in contact with the springs and forces them away from the stem, causing the stem to fall, so that the valve *g²* will rest upon its seat *a'* and close the passage leading from the reservoir and also seating the valve *f*, closing the passage leading from the regulator. This occurs when the burning fluid in the reservoir A is at such a point that the reservoir A needs replenishing.

Communicating with the upper portion of the reservoir A is a pipe *k*, which also leads to the lamp I. This pipe is for the purpose of conveying the heating or illuminating gas that is used for pressure to the burner for the preliminary heating of the burner.

The pipe I is provided with a valve *i'*, and the pipe K is provided with a valve *k'*. *c* is a by-pass forming a communication between the pipes *k* and *i*, and in the passage *c* is a valve *c'*.

The operation of the apparatus is as follows: The reservoirs are so proportioned that a certain amount of burning fluid will be used for a certain number of hours. The tank B is filled with burning fluid and the reservoir D is charged with gas under pressure, the

pressure being more than necessary for the purpose of forcing the burning fluid from the reservoir A to the lamp, and this pressure is reduced by the regulator E. We will suppose that the tank is charged with burning fluid and the reservoir A is empty, the valves f and g^2 being closed. The valve k' in the gas-pipe k is opened and the gas is ignited at the burner, thus reducing the pressure in the upper portion of the reservoir A. As soon as this pressure is reduced the fluid from the tank B will open the check-valve b^2 and flow into the reservoir A by gravity, thus causing the float H to be raised. This float will be carried by the incoming fluid until it strikes the flange g' on the stem G, when it will raise the stem, causing the valve g^2 to be raised from its seat and also raising the valve f from its seat. Thus the desired pressure is immediately placed upon the fluid in the reservoir A from the container D, and this pressure being greater than the pressure of the incoming fluid from the tank B causes the check-valve to close automatically. The valve k' is then closed and the valve i' in the pipe I opened, allowing the fluid from the reservoir A to be forced up into the lamp I. The lamp, being previously heated by the ignition of the gas, vaporizes or gasifies the fluid. As the float lowers the above operation will be repeated.

In some instances it may be necessary to feed the oil direct from the reservoir B to the lamp, and in this case the valve c' in the by-pass c is opened, so that there is direct communication between the pipes b and i .

A three-way valve may be used, as shown in Fig. 3, in place of the two valves i' and k' , and a single pipe connected to the burner.

The details of construction may be varied without departing from the main object of my invention.

I claim as my invention—

1. The combination of the reservoir, means for admitting gas to the reservoir, a burner communicating with both the upper and lower portions of the reservoir, and means for automatically closing the passage leading from the bottom of the reservoir when the fluid in the reservoir is low, and means for regulating the flow of gas to the upper portion of the reservoir, substantially as described.

2. The combination of the reservoir, a container for gas under pressure, a passage forming a communication between the container and the upper portion of the reservoir, a regulator in the passage, a burner communicating

with the bottom of the reservoir, a tank also communicating with the reservoir, a check-valve for allowing the flow of fluid from the tank into the reservoir, and means for preventing the admission of gas under pressure when the fluid in the reservoir is low and also preventing the escape of fluid from the reservoir to the lamp when the fluid in the reservoir is low, and an escape for gas under pressure so that when the pressure in the reservoir is reduced fluid will automatically flow from the tank into the reservoir, substantially as described.

3. The combination of a reservoir, a tank situated above the reservoir, a pipe forming communication with the tank and with the bottom of the reservoir, a check-valve in said pipe to prevent the fluid from escaping from the reservoir through the pipe, a container for gas under pressure, a pipe leading from the container to the upper portion of the reservoir, a regulator in said pipe for reducing the pressure, a pipe leading from the bottom of the reservoir to the burner, a float in the reservoir, and valves for closing the passage leading from the container and from the reservoir to the lamp, said valves being actuated by the float, substantially as described.

4. The combination of a reservoir, a container for gas under pressure, a pipe leading from the container to the reservoir, a regulator in said pipe, a burner, a pipe leading from the bottom of the reservoir to the burner, a pipe leading from the top of the reservoir to the burner, valves in said pipes, a float within the reservoir, and means actuated by said float when the liquid is low in the reservoir to close the outlet from the bottom of the tank to the lamp and the inlet from the gas-container, substantially as described.

5. The combination of a reservoir, a burner communicating with the bottom of the reservoir and connected independently with the top of the reservoir, a tank mounted above the reservoir and communicating with the bottom of the reservoir, a valve in said pipe, a by-pass connecting the pipe leading from the tank with the pipe leading from the reservoir of the burner, and a valve in said by-pass, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GUSTAVE A. LOEBEN.

Witnesses:

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