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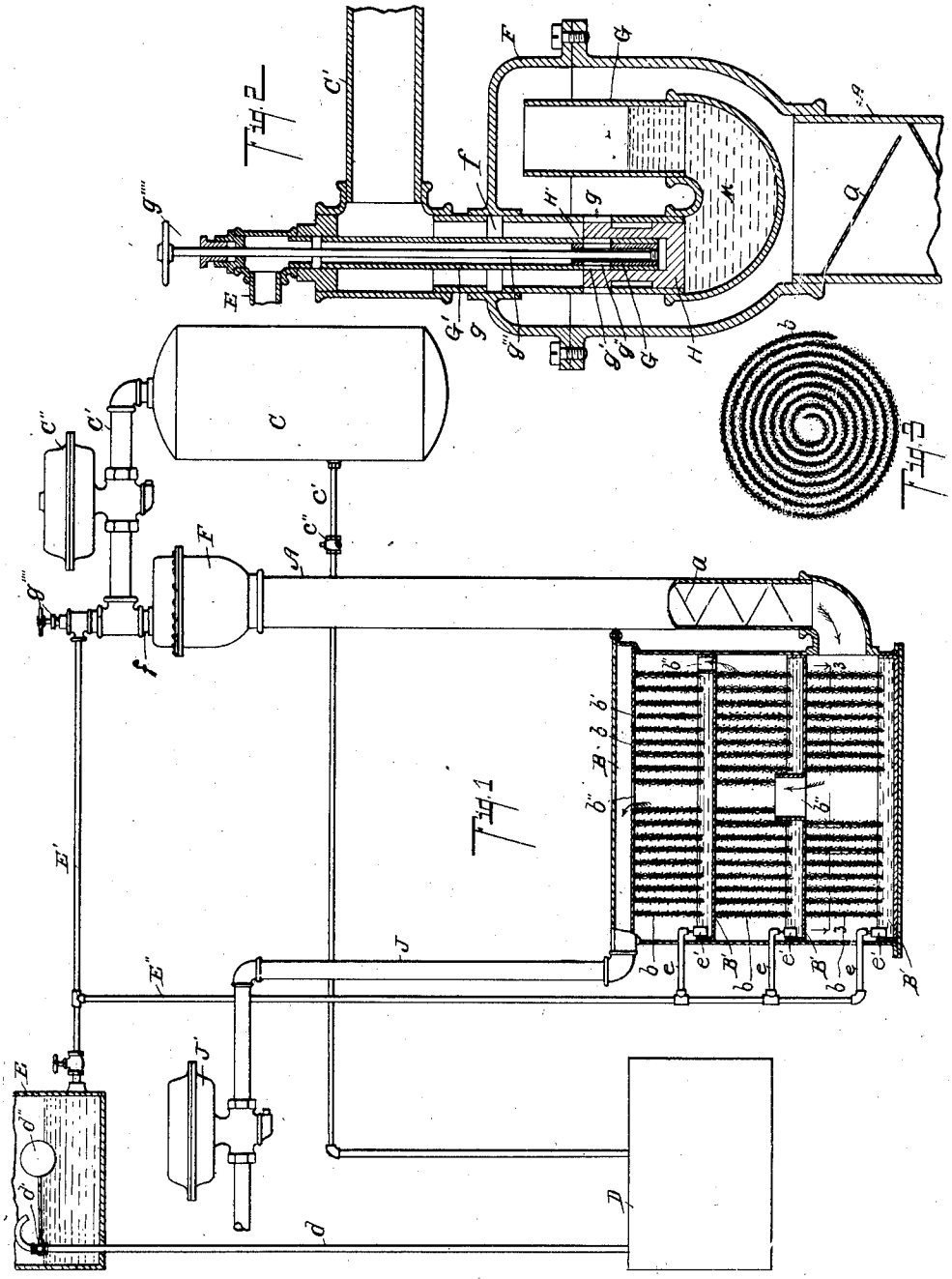
M. D. COLBATH.

CARBURETER.

APPLICATION FILED MAY 20, 1905.



Witnesses:

Wesley F. Adams

W. C. Margeson

Inventor,

Monroe D. Colbath

By Chappell & Earl

Att'ys

UNITED STATES PATENT OFFICE.

MONROE D. COLBATH, OF HAMPDEN, MAINE.

CARBURETER.

No. 883,171. Specification of Letters Patent. Patented March 31, 1908.

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To all whom it may concern:

Be it known that I, MONROE D. COLBATH, a citizen of the United States, residing at the city of Hampden, county of Penobscot, State of Maine, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to improvements in carbureters.

The objects of this invention are: first: to provide an improved carbureter in which the introduction of the air and the liquid hydrocarbon in proper proportions is automatically controlled. Second: to provide an improved carbureter which is of large capacity and, at the same time, simple and compact in structure. Third: to provide an improved carbureter in which practically all of the liquid hydrocarbon is utilized.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawing forming a part of this specification, in which:

Figure 1 is a detail side elevation view of a structure embodying the features of my invention, parts being shown in section to show their structure, and other parts are shown in conventional form. Fig. 2 is a detail vertical sectional view of my improved combined air and liquid hydrocarbon feed valve. Fig. 3 is a detail transverse sectional view taken on a line corresponding to line 3—3 of Fig. 1, showing the arrangement of the spiral partitions *b* of the auxiliary carbureter chamber B.

In the drawings, similar letters of reference refer to similar parts throughout the several views.

Referring to the drawing, I provide a main carbureter chamber A and an auxiliary carbureter chamber B. The main carbureter chamber is preferably cylindrical in form, and is arranged in a vertical position. It is preferably comparatively small in diameter and of considerable length.

Arranged within the main carbureter chamber is a plurality of carbureting screens *a*. These screens are arranged in an inclined position, one above another, so that the upper screens deliver onto the screen next below, the screens being alternately inclined.

The main carbureter chamber is connected at its lower end to the lower end of the auxiliary carbureter chamber B, and delivers thereto. Within the auxiliary carbureter chamber is arranged a plurality of pans B′, one above another. The chambers between these pans are connected by passages *b*″. The pans B′ are adapted to contain liquid hydro-carbon, as is illustrated in Fig. 1. The delivery of this liquid hydro-carbon is controlled by suitable valves and floats *e*′, as will be hereinafter pointed out.

The partially carbureted air passing through the auxiliary from the main carbureter chamber is caused to take a spiral passage by the spiral partitions *b*. These partitions are preferably made of some thin material provided with a covering of cloth or other suitable wicking material *b*′, adapted to carry up the liquid hydro-carbon by capillarity. The lower edges of the partitions project into the liquid hydro-carbon contained in the pans, as is illustrated in Fig. 1.

The gas and carbureted air, in passing through the auxiliary carbureter chamber, is caused to pass through a very long passage, so that it becomes properly carbureted.

The delivery pipe is connected to the upper end of the auxiliary carbureter chamber.

C is the air tank to which the air may be supplied under pressure by any suitable means, the same not being here illustrated. This air tank is connected to the upper end of the main carbureter chamber A by means of the pipe C′ and the valve casing F which is mounted upon the upper end of the carbureter chamber, as clearly appears from the drawings.

A pressure regulator C″ is provided for the air supply pipe. The delivery pipe L is also supplied with a pressure regulator, as I′. The air tank and pressure regulators are shown in conventional form.

D represents the liquid hydro-carbon storage tank—which is also shown in conventional form.

A liquid hydro-carbon feed reservoir E is provided. This reservoir is supported in an elevated position so that the liquid hydro-

carbon is fed by gravity. The liquid hydro-carbon is elevated to the feed reservoir through the pipe d by means of air pressure, the storage reservoir being connected to the air tank by means of a pipe c'. The pipe d is provided with a suitable valve d'. A float d'' is provided for controlling the valve d', thereby controlling the level of the liquid hydro-carbon in the feed reservoir. The pipe c' is also provided with a valve, as c'', which may be used, if desired, to control the delivery of the liquid hydro-carbon to the feed reservoir. The liquid hydro-carbon is delivered to the main carbureter chamber by means of the pipe E'. A branch pipe E'', which is provided with branches e, delivers the liquid hydro-carbon to the pans B' of the auxiliary carbureter chamber.

The branch pipes e of the pipe E'' project through the walls of the chamber B and are provided with suitable valves and floats e' which are illustrated in conventional form. By this means the liquid hydro-carbon is kept at a constant level in the pans B'.

The delivery of liquid hydro-carbon to the main carbureter chamber is automatically controlled by the delivery of air thereto, and the delivery of air is, in turn, controlled by the delivery of gas from the carbureter.

The pressure regulators C'' and J' are so set that when the pressure in the carbureter chambers falls below a pre-determined point, the air is admitted. The incoming air opens the liquid hydro-carbon valve, and admits the liquid hydro-carbon so long as the air continues to enter.

The ports for the air and the liquid hydro-carbon are so proportioned that the air and liquid hydro-carbon are admitted in proper proportions. The structure by which this is accomplished consists of an exterior casing F which is mounted on the carbureter chamber A and is connected by means of a coupling f to the air pipe C'. Within the casing F is supported a U-shaped casing G, one end of which opens in the casing F and the other into the coupling f. The casing G is provided with ports g through which the air and liquid hydro-carbon is delivered. These ports are controlled by a piston valve H which normally bears against the stop H' which is mounted on the oil delivery tube G'. This valve H is chambered to receive the lower end of the liquid hydro-carbon delivery tube G' which is provided with ports g'. The liquid hydro-carbon delivery tube G' is arranged through the coupling f and is connected to the pipe E'.

When the valve H is in its normal or closed position, it not only closes the ports g, but also the ports g'. The valve H is held in its normal position by means of the mercury M which the casing G contains, as clearly appears in the drawings. It is evident, however, that a spring might be used for this purpose. The mercury is preferred as the desired pressure upon the valve can be accurately gaged thereby, and remains constant. When a spring is used, the shape of the inner casing G may be modified.

The size of the ports g' is controlled by means of the cylinder g'' which is provided with openings adapted to be brought into register therewith. It is evident that by adjusting this cylinder, the size of the delivery ports can be controlled. This adjustment is accomplished by means of a rod g''' upon the outer end of which is a suitable nurl g''''. With the parts thus arranged, when the pressure in the carbureter chamber falls below a predetermined point, the pressure in the air supply pipe opens the valve H, thereby permitting the delivery of both air and liquid hydrocarbon to the main carbureter. As soon as the pressure within the carbureter chambers again reaches the predetermined point, the valves are closed.

I have illustrated and described my improved carbureter in detail in the form preferred by me on account of its simplicity and economy. I am, however, aware that it is capable of considerable variation in structural details without departing from my invention.

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

1. The combination of a carbureter chamber; an air supply pipe; a carbureted air or gas delivery pipe; a pressure regulator for said air pipe; an air supply tank; a liquid hydro-carbon storage reservoir; a pipe connecting said air supply tank to the upper end of said liquid hydro-carbon storage reservoir; a feed reservoir; a pipe connecting said storage reservoir to said feed reservoir; a valve in the said pipe; a float therefor arranged in said feed reservoir; a combined air and liquid hydro-carbon valve, consisting of an exterior casing opening into said main carbureter chamber, an inner U-shaped tubular casing, ports in said inner casing, a hollow piston valve arranged therein adapted to control said ports, a liquid in said inner casing adapted to hold said valve normally in its seat; a liquid hydro-carbon delivery tube having ports therein extending into said valve, said valve being adapted to close said ports when in its closed position; a cylinder arranged within said liquid hydro-carbon delivery tube, having openings therein adapted to be brought into register with said ports; and a rod for adjusting said cylinder, for the purpose specified.

2. The combination of a carbureter chamber; an air supply pipe, a carbureted air or gas delivery pipe; a pressure regulator for said air pipe; an air supply tank; a liquid

hydro-carbon storage reservoir; a feed reservoir; a pipe connecting said storage reservoir to said feed reservoir; a valve in the said pipe; a float therefor arranged in said feed reservoir; a combined air and liquid hydro-carbon valve, consisting of an exterior casing opening into said main carbureter chamber, an inner U-shaped tubular casing, ports in said inner casing, a hollow piston valve arranged therein adapted to control said ports, a liquid in said inner casing adapted to hold said valve normally in its seat; and a liquid hydro-carbon delivery tube having ports therein extending into said valve, said valve being adapted to close said ports when in its closed position; for the purpose specified.

3. The combination of a carbureter chamber; an air supply pipe; a carbureted air or gas delivery pipe; a pressure regulator for said air pipe; an air supply tank; a liquid hydro-carbon storage reservoir; a pipe connecting said air supply tank to the upper end of said liquid hydro-carbon storage reservoir; a feed reservoir; a pipe connecting said storage reservoir to said feed reservoir; a valve in the said pipe; a float therefor arranged in said feed reservoir; a combined air and liquid hydro-carbon valve, consisting of an exterior casing opening into said main carbureter, an inner tubular casing, ports in said inner casing, a hollow piston valve arranged therein adapted to control said ports; a liquid hydro-carbon delivery tube having ports therein extending into said valve, said valve being adapted to close said ports when in its closed position; a cylinder arranged within said liquid hydro-carbon delivery tube, having openings therein adapted to be brought into register with said ports; and a rod for adjusting said cylinder, for the purpose specified.

4. The combination of a carbureter chamber; an air supply pipe; a carbureted air or gas delivery pipe; a pressure regulator for said air pipe; an air supply tank; a liquid hydro-carbon storage reservoir; a pipe connecting said air supply tank to the upper end of said liquid hydro-carbon storage reservoir; a feed reservoir; a pipe connecting said storage reservoir to said feed reservoir; a valve in the said pipe; a float therefor arranged in said feed reservoir; a combined air and liquid hydro-carbon valve, consisting of an exterior casing opening into said main carbureter chamber, an inner tubular casing, ports in said inner casing, a hollow piston valve arranged therein adapted to control said ports; and a liquid hydro-carbon delivery tube having ports therein extending into said valve, said valve being adapted to close said ports when in its closed position, for the purpose specified.

5. The combination of a carbureter chamber; an air supply pipe; a pressure regulator for said pipe; a liquid hydro-carbon feed reservoir; a combined air and liquid hydro-carbon valve, consisting of an exterior casing, an inner U-shaped tubular casing, ports in said inner casing a hollow piston valve arranged therein adapted to control said ports, and a liquid in said inner casing adapted to hold said valve normally in its seat; a liquid hydro-carbon delivery tube having ports therein extending into said valve, said valve being adapted to close said ports when in its closed position; a cylinder arranged within said liquid hydro-carbon delivery tube, having openings therein adapted to be brought into register with said ports; and a rod for adjusting said cylinder, for the purpose specified.

6. The combination of a carbureter chamber; an air supply pipe; a pressure regulator for said pipe; a liquid hydro-carbon feed reservoir; a combined air and liquid hydro-carbon valve, consisting of an exterior casing, an inner U-shaped tubular casing, ports in said inner casing, a hollow piston valve arranged therein adapted to control said ports, and a liquid in said inner casing adapted to hold said valve normally in its seat; a liquid hydro-carbon delivery tube having ports therein extending into said valve, said valve being adapted to close said ports when in its closed position, all co-acting for the purpose specified.

7. The combination of a carbureter chamber; an air supply pipe; a pressure regulator for said pipe; a liquid hydro-carbon feed reservoir; a combined air and liquid hydro-carbon valve, consisting of an exterior casing, an inner tubular casing, ports in said inner casing, a hollow piston valve arranged therein adapted to control said ports; a liquid hydro-carbon delivery tube having ports therein extending into said valve, said valve being adapted to close said ports when in its closed position; a cylinder arranged within said liquid hydro-carbon delivery tube, having openings therein adapted to be brought into register with said ports; and a rod for adjusting said cylinder, for the purpose specified.

8. The combination of a carbureter chamber; an air supply pipe; a pressure regulator for said pipe; a liquid hydro-carbon feed reservoir; a combined air and liquid hydro-carbon valve, consisting of an exterior casing, an inner tubular casing, ports in said inner casing, a hollow piston valve arranged therein adapted to control said ports; and a liquid hydro-carbon delivery tube having ports therein extending into said valve, said valve being adapted to close said ports when in its closed position, for the purpose specified.

9. The combination of a carbureter chamber; an air supply pipe; a combined air and liquid hydro-carbon valve, consisting of a

casing having suitable ports connected to the air supply, a piston valve arranged in said casing adapted to control said ports; and a liquid hydro-carbon delivery tube extending into said casing, said piston valve being adapted to close said ports when in its closed position, for the purpose specified.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

MONROE D. COLBATH. [L. S.]

Witnesses:

TERENCE B. TOWLE,

MYRA M. TUCK.