

F. P. JOHNSTON.

CARBURETER.

APPLICATION FILED MAR. 30, 1911.

1,027,340.

Patented May 21, 1912.

2 SHEETS—SHEET 1.

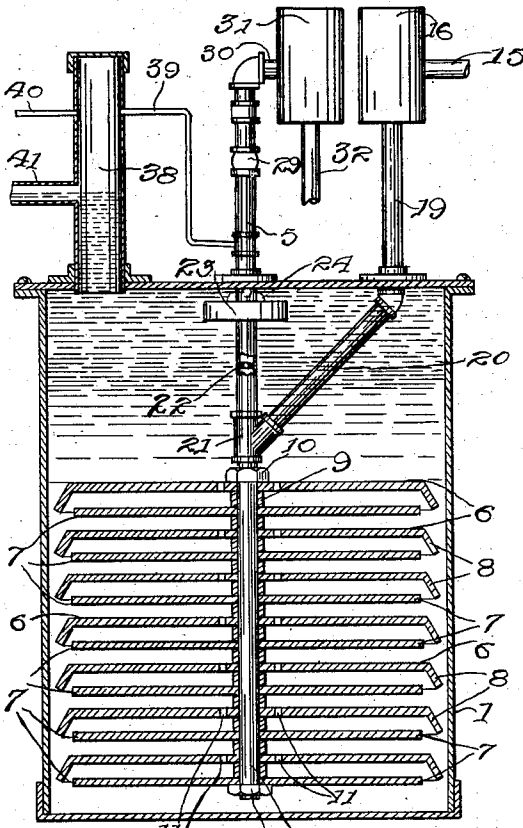


Fig. 1.

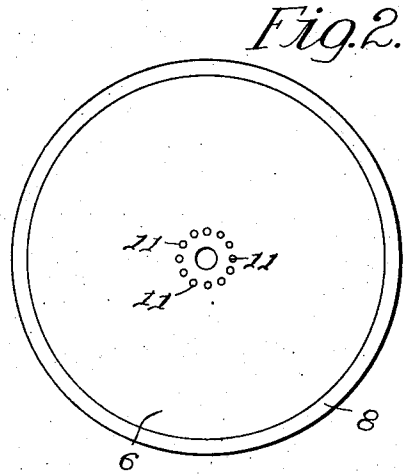


Fig. 2.

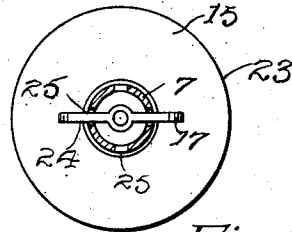


Fig. 3.

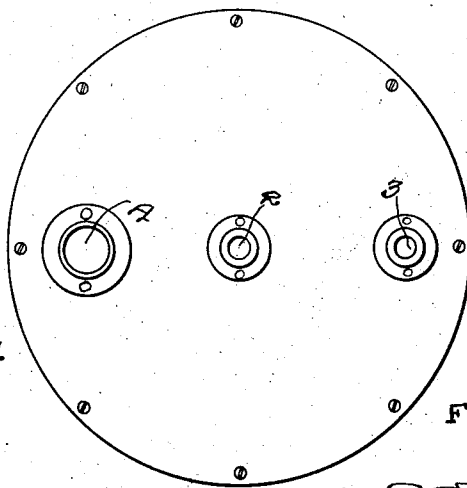


Fig. 4.

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2 SHEETS—SHEET 2.

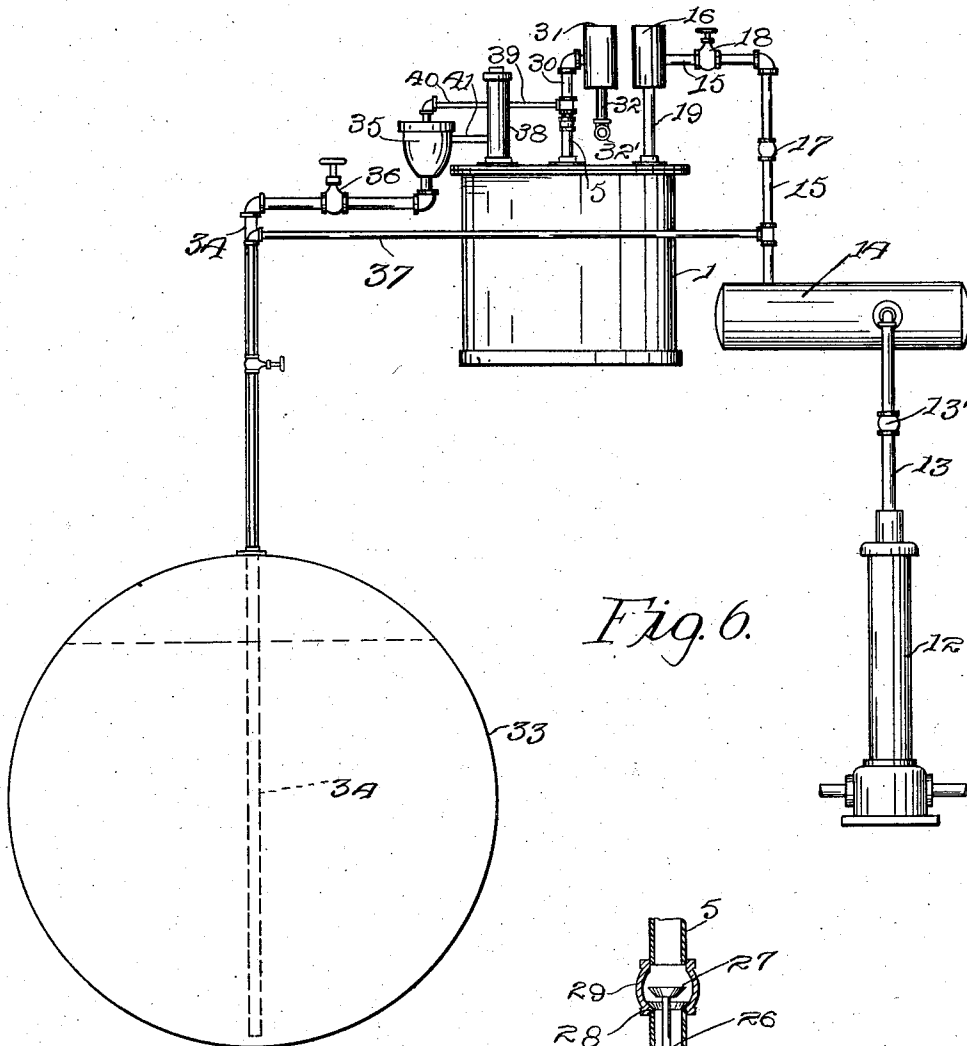


Fig. 6.

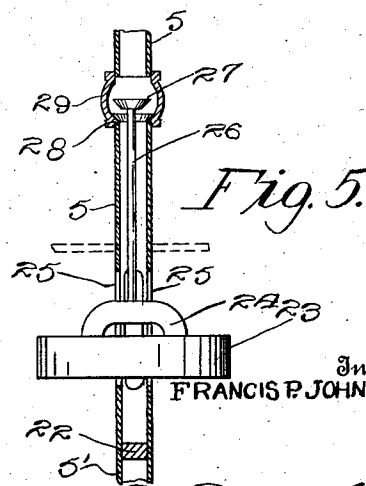


Fig. 5.

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UNITED STATES PATENT OFFICE.

FRANCIS P. JOHNSTON, OF OAKLAND, CALIFORNIA.

CARBURETER.

1,027,340.

Specification of Letters Patent.

Patented May 21, 1912.

Application filed March 30, 1911. Serial No. 617,913.

To all whom it may concern:

Be it known that I, FRANCIS P. JOHNSTON, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to apparatus for carburation of air and has special reference to carbureters.

The principal object of this invention is the providing of means whereby the amount of hydro-carbon vapor contained in the air may be regulated, or in other words the richness of the gas may be controlled. As is well known the amount of vapor in the air above the saturation point is dependent on the pressure of the air, and this principle is made use of in this device.

The invention has for its object to provide an improved apparatus for carburation of air in which a liquid fuel, such as oil, is commingled with air under pressure so as to provide a combustible gas.

The invention further has for its object to provide an improved gas generating apparatus in which air is mixed with a liquid fuel, such as oil, so constructed and arranged that the oil in the generator will be maintained at a constant level as well as maintaining a constant pressure of the delivered gas.

Referring to the accompanying drawings: Figure 1 is a view in vertical section of a portion of a gas generating apparatus constructed in accordance with this invention with other parts broken away. Fig. 2 is a plan view of one of a number of disks mounted in the generator. Fig. 3 is a detail view of an automatic device located in the generator with the oil delivery pipe in cross section. Fig. 4 is a plan view of the cover of the generator removed. Fig. 5 is a detail view in vertical section of a part of the apparatus located within the generator showing the oil pipe in vertical section and an automatic valve mounted thereon. Fig. 6 is a diagrammatic view of the entire apparatus in elevation.

In the construction of the apparatus, a cylindrical casing 1 is provided having its top provided with a central opening 2 and side openings 3 and 4. Projecting through the top of the casing is a vertical pipe 5 for the passage of the commingled oil and air,

said pipe extending down into the casing 1 and connected as hereinafter described with a pipe 5' which extends nearly to the bottom of the casing and has an open lower end. Mounted on the pipe 5' are a number of disks 6 and 7, the disks 7 alternating with the disks 6 and the disks 6 being provided with a downwardly inclined flange 8 which extends down over the periphery of the adjacent disk 7. The disks 6 and 7 are spaced apart by suitable spacing blocks 9 and are held in position on the pipe 5' by means of the nuts 10 located at each end of the pipe 5', and clamped against the adjacent disk 6 at one end and 7 at the other. Each of the disks 7 is provided with a number of holes 11 arranged about the center of the disk as shown in Fig. 2 for the passage of air as hereinafter explained.

Air is forced under pressure into the cylinder 1 by means of a pump 12 connected by a pipe 13 with an air storage tank 14, a check valve being located in the pipe 13 at the joint 13'. The air in the storage tank 14 is conveyed through the pipe 15 to the pressure regulating governor located in the casing 16, the pipe 15 being provided with a check valve located in the joint 17 and the shut off valve 18. The air passes from the casing 16 through a pipe 19 mounted in the opening 3 on the top of the casing 1, and through a pipe 20 to a V-shaped joint coupling 21 connecting the pipe 5'. In order to prevent the air passing through the pipe 20 into the pipe 5 from ascending in the latter, the pipe 5 is provided with a plug 22 located above the joint 21. Mounted on the pipe 5 above the plug 22 is an automatic float valve 23 provided with a yoke 24 which projects through and is slidable vertically in the slots 25 in the sides of the pipe 5 and connected to the yoke 24 is a vertical rod 26 having on its upper end a valve 27 movable into and out of seating contact with the valve seat 28 in the bottom of the valve chamber 29 communicating with the pipe 5. The upper end of the pipe 5 is connected by an elbow jointed pipe 30 with a regulating valve located in the casing 31. The casing 31 is connected by a pipe 32 with the service or delivering pipe 32'.

Referring to Fig. 6, 33 indicates a storage tank into which projects a pipe 34 extending to a point near the bottom of the tank and having its lower end open, the pipe 34 extending to a casing 35 in which

is located a float feed valve. A shut off valve 36 is located in the pipe 34. A small branch pipe 37 is connected at one end with the pipe 15 and at its other end with the top of the oil tank 33 by means of which a sufficient pressure in the top of the oil above the oil is maintained to force the oil into the generator. Mounted in the opening in the top of the casing 1 is a short vertical tube 38 closed at its upper end and connected by a pipe 39 with the pipe 5, and by a pipe 40 with the casing 35 in which is located the float feed valve. The casing 35 is connected by a pipe 41 with the pipe 38, and the oil level of the generator is maintained near the center of the pipe 38.

The operation of the device is as follows:—The pump 12 maintains a predetermined pressure within the air reservoir 14 and from the latter air is supplied through the pipe 15, casing 16—containing the pressure regulator governor—pipe 19, pipe 20, and pipe 5' to the bottom of the casing 1. The air discharged out of the lower end of the pipe 5' passes into the oil and through the same horizontally beneath the lowest disk 7 until it reaches the edge thereof where it ascends and is cut off by the flange 8 on the adjoining disk 6 above the same. The air is directed by the disk 6 toward the center thereof, and passes up through the holes 11 to the underside of the next plate 7 when the air again passes out to the edge of said plate and up beneath the next plate 6 where it passes to the holes 11 of the plate and so on successively from plate to plate until the air reaches the top plate 6 when it passes out of the holes 11 into the oil. It will be seen that by means of this construction the air is caused to travel a considerable distance through the oil or other liquid fuel so that it becomes thoroughly saturated therewith. After the air has passed out through the top plate 6 it enters the pipe 5 through the vertical slots 25, and passes up through the tube 5 through the opening in the bottom of the valve chamber 29 and on up through the pipe 5 to the casing 31 and thence to the service pipe 32'. The air passing through the pipe 37 to the top of the tank 33 maintains the pressure of the oil so that it is forced upward to the casing 35 in which the float valve automatically maintains the oil level about the center of the pipe 41. The pressure in the top of the casing 35 and pipe 38 is kept the same as that in the pipe 30 by means of the pipes 39 and 40. When the supply of oil becomes low within the generator the float 23 drops lowering the valve 27 and closing the pipe 5 thereby shutting off the flow of gas from the generator.

The object of the automatic valve 27 is to stop the flow of gas before it becomes weak causing it to snap back when lighted or

when an open flame becomes extinguished by a slight breeze and allows weak gas to escape.

By means of the pressure regulator 16 the pressure within the tank 1 is held constant and at any desired point below that in the tank 14. Then as the air passes through the oil it takes up vapor until it becomes saturated for that pressure, and in passing through the pressure regulator 31 the pressure is again reduced increasing the volume and giving an unsaturated gas. It will be seen that if the pressure regulator 31 be set for a different pressure in the gas line the higher the pressure is maintained within the tank 1 the greater will be the expansion of the gas after passing through the regulator and in consequence the less will it be saturated relative to the gas within the tank 1.

What I claim is:—

1. In an apparatus of the kind described, a carbureter consisting of a closed casing, an air supply pipe extending to the bottom of said casing and having a lower open end, a number of disk shaped plates mounted on said pipe in spaced relation to each other, the alternating plates of said disk shaped plates each being formed with a downwardly inclined flanged edge and with apertures near the center, means for supplying air under pressure to the bottom of the casing and for regulating the pressure thereof, means for supplying oil to said casing, and means for maintaining the surface of said oil at a constant level.

2. In an apparatus of the kind described, a carbureter consisting of a casing, an air supply pipe suspended in said casing, a pipe connected to the upper end and separated from said air supply pipe and projecting through the top of the casing and provided with outlet ports in its sides within the casing, an automatic valve located in said pipe, a float connected with said automatic valve, a number of disks mounted on the air supply pipe and spaced apart from each other, the alternate disks having perforations adjacent to the center thereof, means for supplying oil to said generator, and means for supplying air under pressure to said generator.

3. In an apparatus of the kind described, a carbureter consisting of a casing having an air supply pipe extending to a point near the bottom of said casing and having the lower open end, a number of disk shaped plates mounted on said pipe and spaced apart from each other, the alternate plates thereof each having a depending flange at its outer edge and apertures adjacent to the center, a pipe located in said casing and projecting out of the top thereof and having outlet ports in its sides, an automatic closing valve located in said pipe with a float

located in said casing and connected with said valve, a vertical pipe mounted on the top of said casing and opening at its lower end into said casing and closed at its upper end, a casing having an automatic float valve, an oil supply tank having a pipe connected with said casing, pipes connecting said casing with said vertical pipe having a closed upper end, a pipe connecting said vertical pipe with the pipe projecting out of the casing, a casing connected with the latter pipe and containing a regulating valve, and a service pipe connected with said latter casing.

4. In an apparatus of the kind described, a carbureter consisting of a casing having an air supply pipe located in said casing with an open lower end adjacent to the bottom of said casing, a number of disks spaced apart from each other, and mounted on said air supply pipe, the alternate disks having apertures adjacent to the center, means for supplying air under pressure to said casing, a pipe projecting into said casing with apertures in its side and closed below and adjacent to said apertures, and an automatically closing valve, a float located in said casing connected with said valve, means for regulating the discharge of oil through said pipe, to a service pipe, means for supplying oil to said generator, and means for main-

taining the oil at a constant level, and forcing it into the generator.

5. In an apparatus of the kind described, a casing having a vertical pipe projecting out of the top of the casing down through the casing and having apertures in its sides and closed below and adjacent to said apertures, a valve chamber in said pipe, an automatically closing valve in said chamber, a float slidably mounted on said pipe, a rod connecting said float with said valve, a pipe connected to the lower end of said pipe and extending down to a point adjacent to the bottom of the casing and having a lower open end, an air supply pipe connected to the upper end of said pipe and projecting out of the top of the casing, a number of disk shaped plates mounted upon the pipe in the lower part of the casing, each alternating disk plate having a depending flange at its outer edge and apertures adjacent to its center, means for supplying air under pressure to said pipe in the lower part of the casing, an oil supply tank, and means for maintaining a constant level of said oil.

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

FRANCIS P. JOHNSTON.

Witnesses:

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F. P. SCHROEDER.