

J. F. BECKER.
 AUTOMATIC CARBURETING MACHINE.
 APPLICATION FILED APR. 3, 1909.

949,140.

Patented Feb. 15, 1910.
 2 SHEETS—SHEET 2.

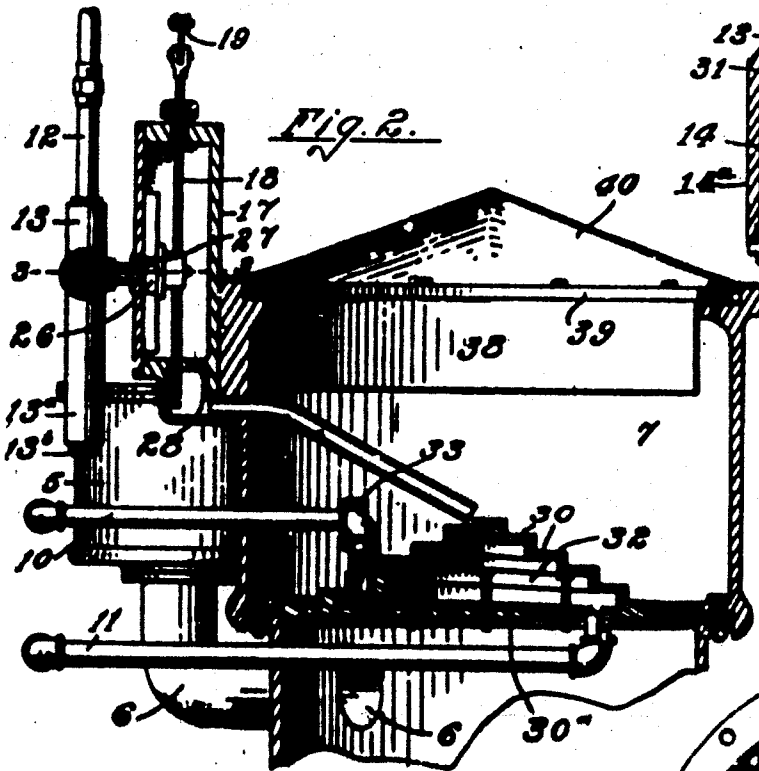


Fig. 2.

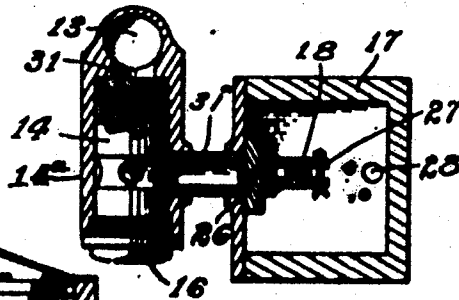


Fig. 3.

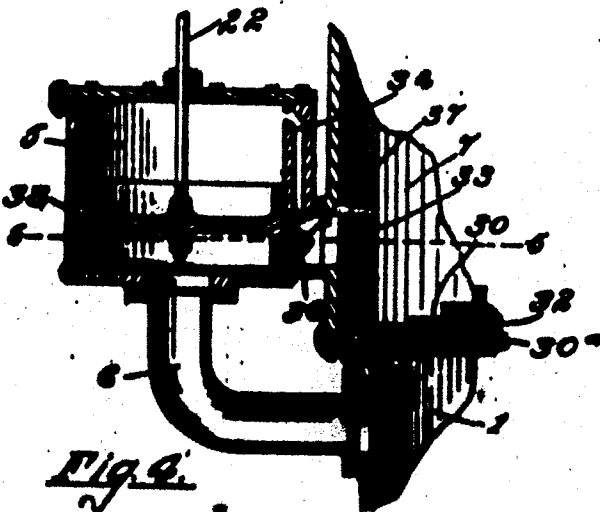


Fig. 4.

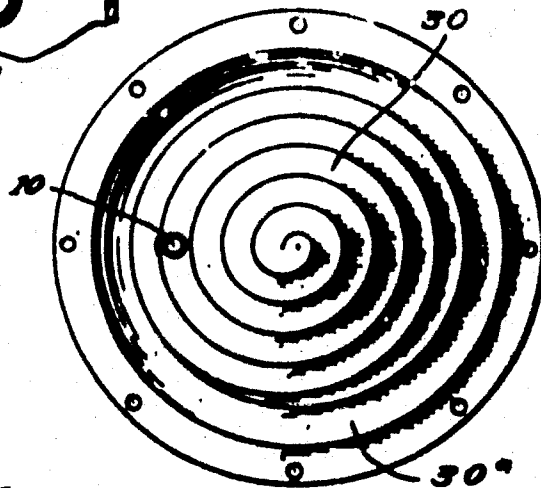


Fig. 6.

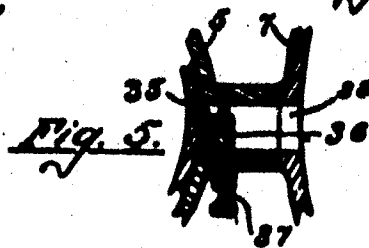


Fig. 5.

Witnesses
 H. O. Van Antwerp
 Georgiana Chase

Inventor
Jacob F. Becker
 By Luther V. Moulton
 Attorney

UNITED STATES PATENT OFFICE.

JACOB F. BECKER, OF MUSKEGON, MICHIGAN, ASSIGNOR TO U. S. GAS MACHINE CO.,
OF MUSKEGON, MICHIGAN, A CORPORATION OF MICHIGAN.

AUTOMATIC CARBURETING-MACHINE.

949,140.

Specification of Letters Patent.

Patented Feb. 15, 1910.

Application filed April 3, 1909. Serial No. 487,847.

To all whom it may concern:

Be it known that I, JACOB F. BECKER, a citizen of the United States of America, residing at Muskegon, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Automatic Carbureting-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in automatic carbureting machines, and its object is to provide an automatically operated machine for carbureting air for the purpose of supplying a combustible mixture for various devices, such as Welsbach lights, heating burners, internal combustion engines, and for various other purposes; and its object is to provide the device with improved automatic means for proportioning the air and hydrocarbon; improved means for vaporizing the hydrocarbon, and with various new and useful features, hereinafter more fully described and particularly pointed out in the claims, reference being had to the accompanying drawings, in which:

Figure 1. is a side elevation of a device embodying my invention; Fig. 2. a vertical section of the upper part of the same on the line 2—2 of Fig. 1.; Fig. 3. an enlarged detail in horizontal section on the line 3—3 of Fig. 2.; Fig. 4. a detail in vertical section through the axis of the cylinder 5 and the chamber 7; Fig. 5. an enlarged horizontal detail on the line 5—5 of Fig. 4. Fig. 6. a plan of the vaporizing cone; and, Fig. 7. a detail of the adjustable bracket 21.

Like numbers refer to like parts in all of the figures.

1 represents an upright cylinder or tank which is supplied with compressed air through the pipe 2 by any convenient air pump or compressor; 3 is a safety valve for said tank; and 4 a pressure gage for the same; 5 is the cylinder of a pressure motor communicating at the bottom with the tank 1 by means of a pipe 6; 7 is a carbureting chamber mounted on the tank 1 with which the lower part of the cylinder 5 communicates by a passage 83 and a narrow vertically elongated port 35 in the side of the cylinder 5. This port is closed by a piston 38 movable in the cylinder 5, when said

piston is in its lowered position and partially or wholly opened as the piston rises. This port 35 is adjusted for width by a slide 36 adjusted by a screw 37, as illustrated in Figs. 4 and 5. A passage 34 communicates with the upper part of the cylinder 5 and the passage 33, whereby the piston 38 is subjected to pressure equal to that in the tank 1 at the lower side, and equal to the pressure in the carbureting chamber 7 at the upper side. The piston is thus moved upward in the cylinder 5 by the difference in the respective pressures at its opposite sides, as hereafter explained, whereby when the pressure falls in the chamber 7, the piston will be raised by the excess of pressure below from the tank 1 and the port 35 opened more or less to permit air to pass from the tank 1 to the carbureting chamber 7.

A rod 22 extends upward from the piston 38 and is connected to the movable end of a lever 19, the other end of which lever is pivoted in a hanger 20 adjustable upon a bracket 21, whereby the length of the short end of the lever may be varied to vary the stroke of the gasoline admission valve, as hereinafter described. The bracket 21 is vertically adjustable to adjust the position of the valve 27 in its relation to the port 26. Pivoted to the lever 19 intermediate its ends is a rod 18, which rod extends downward into a valve chest 17 in which is a valve 27 moved by said rod, to more or less open a narrow vertically elongated port 26 communicating with a filter, which filter comprises a cylindrical body 14 integral with the plug 16, which closes one end of the casing 14, the open end being covered by a screen 31. The cylinder 14 is provided with an annular groove which communicates with the port 26 and an opening between its groove and interior. The open end of the cylinder communicates with a vertical chamber 13 having a downward extension 13^a to accumulate sediment therein and closed by a removable plug 13^b.

12 is a pipe to supply gasoline to the chamber 13. From thence it flows through the screen 31 and the filtering material contained within the cylinder 14, thence out through the opening in the wall of the cylinder into the annular groove and through a second screen 31^a and escapes through the vertically elongated port 26, closed more or less by the valve 27, and the air through a

passage 28 and pipe 29 to a point near the apex of the vaporizer 30, which latter consists of a hollow spiral stepped cone upon the top of which the gasoline is discharged from the pipe 29 and flowing thence downward over the downwardly inclined spiral surface of the cone is vaporized by the heat thereof. For heating the cone, it is provided with a chamber 32, which is supplied with steam by the pipe 10 and the water of condensation is removed therefrom by a pipe 11.

24 is a pipe to drain any surplus fluid from the bottom of the chamber 7 in the event that it should not be wholly vaporized therein. The bottom 30^a of the cone is extended outward and forms a partition between the tank and chamber 7, being strengthened by the cone to resist pressure in the tank.

8 is a pipe through which the carbureted air is carried to the respective burners or other place of use, and 9 is a throttle valve to open and close said pipe.

25 is a small pipe extending to the gasoline tank (not shown) to balance the pressure therein with the pressure in the chamber 7 to permit the gasoline to flow through the pipe 12, filter 14, and into the chamber 7.

In operation whenever the pipe 8 is wholly closed, the pressure will be balanced in the tank 1 and chamber 7 and the piston 38 will descend by gravity and close the ports 35 and 36 thus automatically cutting off the flow of air and gasoline to the chamber 7. Whenever the carbureted air is permitted to flow through the pipe 8, the pressure will fall in the chamber 7 and the excess of pressure in the tank 1 will raise the piston 38 more or less, and thus open the ports 35 and 36 more or less according to the rapidity of the flow through the pipe 8, thus automatically supplying the air and gasoline to the vaporizing chamber. By adjusting the hanger 20 toward and from the rod 18, the throw of the valve 27 and consequent relative quantity of gasoline admitted can be adjusted to properly proportion the same with the air, and by adjusting the slide 36, the air inlet will be adjusted. By means of the turn buckle 23, the rod 22 may also be adjusted in length and thus adjust the position of the piston 38 relative to the port 35, whereby to determine the relative quantity of air admitted. A proper quantity of steam admitted through the pipe 10 will sufficiently heat the cone 30 and effectually vaporize the hydrocarbon flowing down spirally over the same.

38 is a thin sheet metal closure for the top of the generating chamber 7. This is held in place by a ring 39. Screws hold the ring 39 in place and the closure 38 is slotted outward to its periphery from the holes where

these screws pass through it. If the pressure in the generating chamber should in any way become too great for the safety of the machine, the closure 38 will blow out.

40 is a cap which rests on the top of the generating chamber and is easily removable, not being fastened in any way.

What I claim is:

1. A carbureting machine, comprising an air tank, a carbureting chamber, means for automatically controlling the flow of air from the tank to said chamber, consisting in a motor operated by the difference in pressure in said tank and chamber, means for supplying liquid hydrocarbon to said chamber, a valve to control the flow of said hydrocarbon, a lever connected to said motor and operated thereby and also connected to the valve to operate the same, and an adjustable fulcrum to said lever to modify the movement of the valve relative to that of the motor.

2. A carbureting machine comprising an air tank, a carbureting chamber, a pressure motor to control the flow of air from the tank to the chamber, means for supplying hydrocarbon to the chamber, a slide valve to control the flow of hydrocarbon, a lever operated by the motor and connected to the valve, a bracket adjustable in the direction of movement of the valve, and a fulcrum for the lever mounted on the bracket and adjustable longitudinally of the lever.

3. A carbureting machine, comprising an air tank, a carbureting chamber, a cylinder having a bottom opening communicating with the tank, a side opening near the top communicating with the chamber and a side opening near the bottom also communicating with said chamber, a piston in the cylinder adapted to close the side opening, an adjustable gate to said opening, a filter having an elongated opening communicating with the chamber, a slide valve to close or open said elongated opening, a lever connected to said valve and piston, and an adjustable fulcrum for said lever to vary the relative movement of the valve and piston.

4. A carbureting machine, comprising an air tank, a carbureting chamber above the air tank, a plate forming a diaphragm between the tank and chamber, a cone in said chamber and integral with said plate to form a heating chamber between the cone and plate and to separate the tank and carbureting chamber, means for supplying a heating fluid to said heating chamber, means for permitting air to flow from the tank to the carbureting chamber in automatically regulated quantities, and means for supplying fluid hydrocarbon to the top of the cone in automatically regulated quantities.

5. A carbureting machine comprising an air tank, a carbureting chamber above the air tank, a plate forming a diaphragm be-

tween the tank and chamber, a cone bottom to the chamber integral with the plate, a heating chamber between the plate and cone bottom, means for supplying a heating medium to said heating chamber, means for permitting an automatically regulated flow of air from the tank to the carbureting chamber, means for supplying an automatically regulated flow of fluid hydrocarbon to the top of the cone.

6. A carbureting machine, comprising an air tank, a carbureting chamber above the tank, a plate forming a diaphragm between the tank and chamber, a cone bottom to the chamber integral with the plate and having a spiral and downwardly inclined upper surface and forming a heating chamber between the same, means for permitting an automatically regulated flow of air from the tank to the chamber, a hydrocarbon filter, and means for permitting an automatically regulated flow of hydrocarbon from the filter to the top of the cone.

7. A carbureting machine, comprising an air tank, a carbureting chamber above the air tank, a plate forming a diaphragm between the tank and chamber, a cone bottom to said chamber integral with the plate and having a downwardly inclined spiral upper surface and a heating chamber beneath the same, a pressure motor adapted to control the flow of air from the tank to the carbureting chamber, a hydrocarbon filter, a valve

to control the escape of liquid from the filter, a passage for conveying liquid from said filter to the top of the cone, and a lever operated by the motor, said lever being connected to the valve to open or close the same.

8. A carbureting machine, comprising an air tank, a carbureting chamber above the same, a conical bottom between the chamber and tank and having an upper spiral and downwardly inclined surface and a heating chamber beneath the same, means for supplying a heating fluid to said heating chamber, a cylinder having a bottom opening communicating with the tank and side openings near the top and bottom communicating with the carbureting chamber, a piston adapted to close or open the lower side opening, a filter having an elongated opening, means for supplying liquid hydrocarbon to the filter, a valve to close or open said elongated opening, a lever connected to the valve to operate the same, an adjustable fulcrum for the lever, means for connecting the lever to the piston, and means for conducting liquid from the filter to the top of the cone.

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

JACOB F. BECKER.

Witnesses:

MYRTLE WURTZLER,
CHARLES B. CROSS.