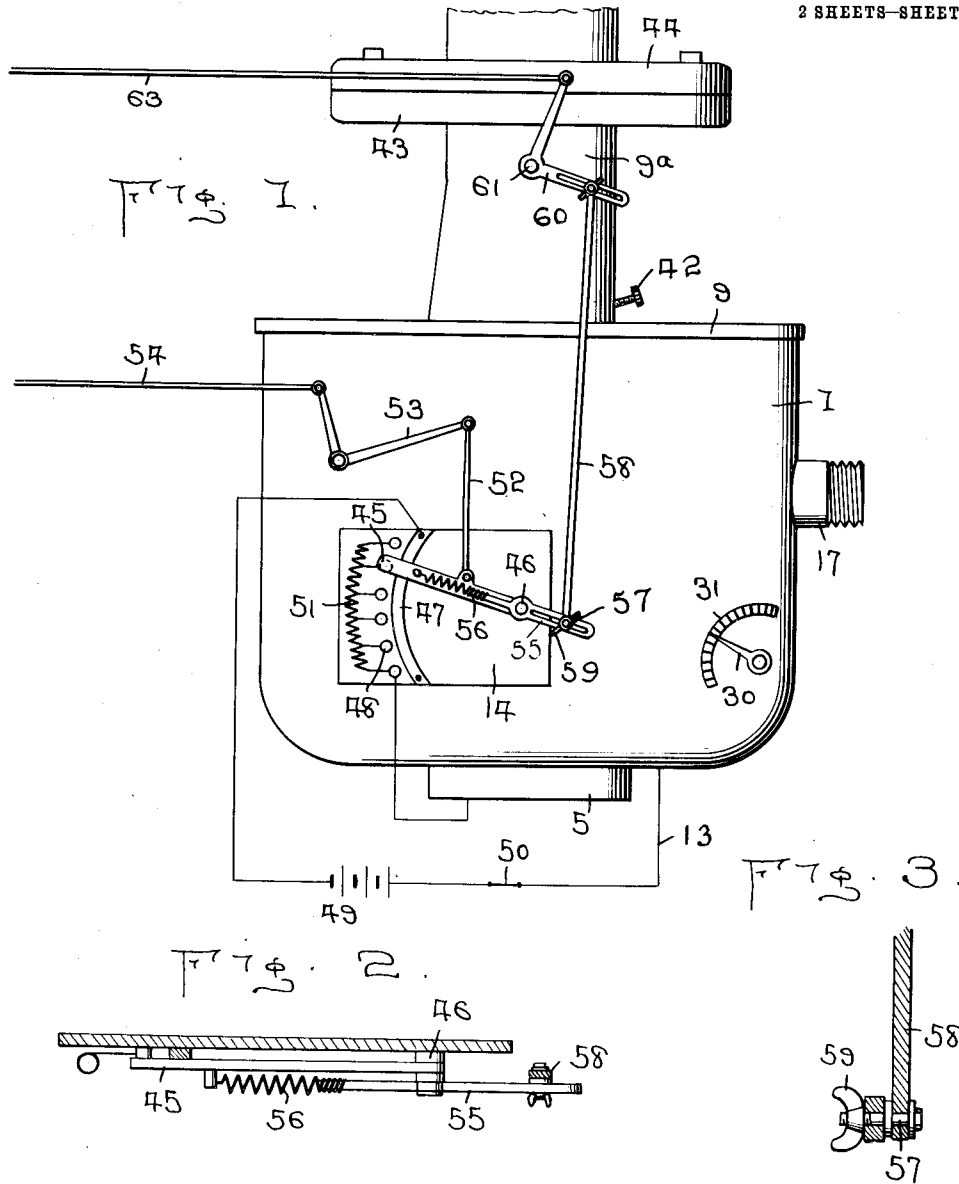


J. A. THOMPSON.
FUEL VAPORIZING DEVICE.
APPLICATION FILED MAY 10, 1912.

1,065,640.

Patented June 24, 1913.

2 SHEETS—SHEET 1.



WITNESSES:

Thos. W. Riley
W. Newcomb

J. A. Thompson INVENTOR

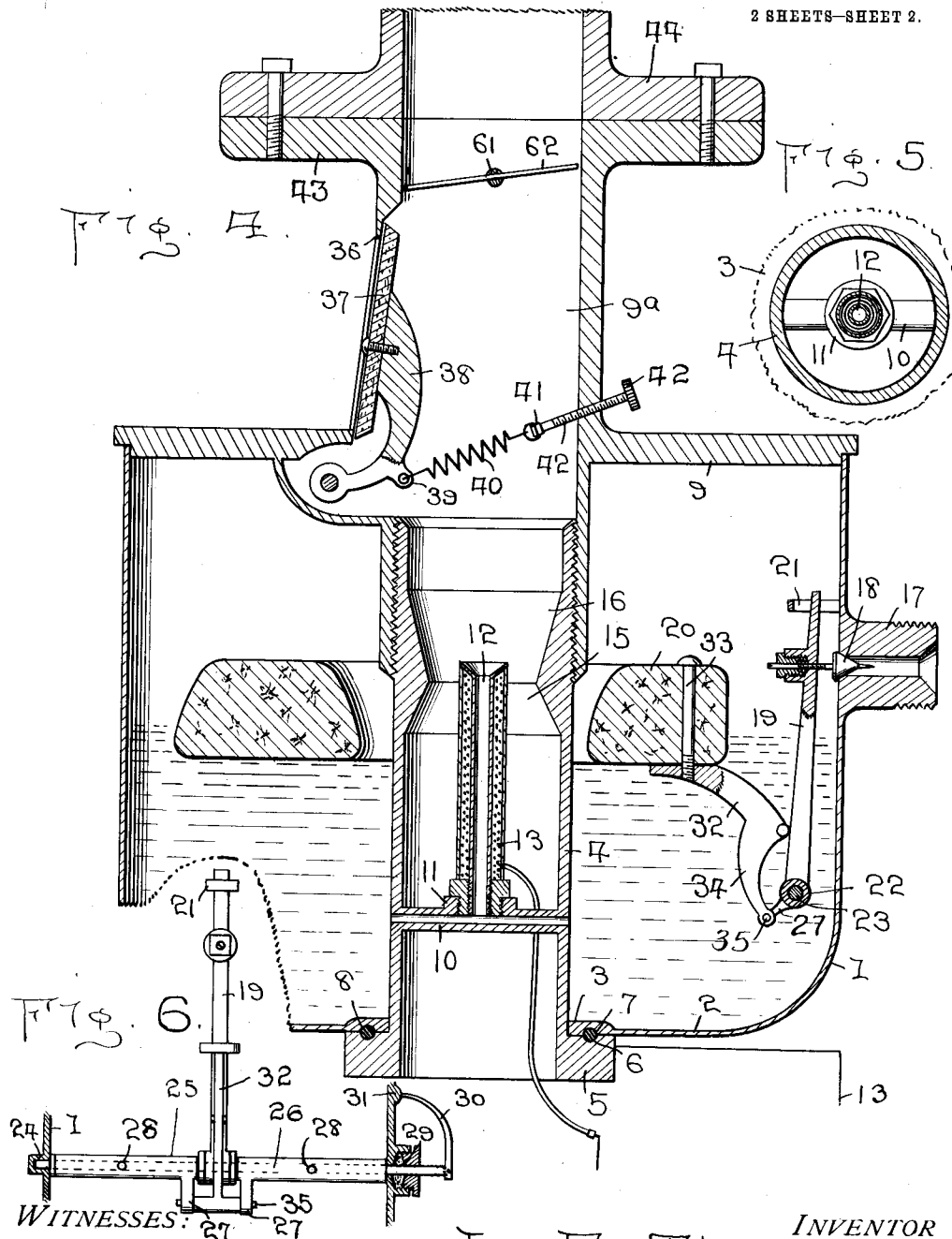
BY *W. T. Fitzgerald & Co.*
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UNITED STATES PATENT OFFICE.

JOHN A. THOMPSON, OF OSKALOOSA, IOWA.

FUEL-VAPORIZING DEVICE.

1,065,640.

Specification of Letters Patent.

Patented June 24, 1913.

Application filed May 10, 1912. Serial No. 696,397.

To all whom it may concern:

Be it known that I, JOHN A. THOMPSON, a citizen of the United States, residing at Oskaloosa, in the county of Mahaska and State of Iowa, have invented certain new and useful Improvements in Fuel-Vaporizing Devices; 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 new and useful improvements in fuel vaporizing devices and more particularly to a carbureter adapted to be used for vaporizing liquid fuel for use in combustion engines.

The object of my invention is to provide an improved device whereby the quantity of liquid fuel vaporized is readily controlled.

A further object of my invention is to provide improved means whereby the quantity of air mixed with said vaporized fuel may be regulated.

Other objects and advantages of my invention will be hereinafter made clearly apparent in the specification and pointed out in the claims.

In the accompanying drawings I have shown the preferred form which my invention may take.

In said drawings, Figure 1 is an elevation of my improved form of carbureter. Fig. 2 is an enlarged horizontal sectional view through the circuit controlling rheostat. Fig. 3 is an enlarged vertical sectional view through a portion of the device shown in Fig. 1. Fig. 4 is an enlarged vertical sectional view through the carbureter shown in Fig. 1. Fig. 5 is a horizontal sectional view through the portion of the carbureter, including the electric heater, and, Fig. 6 is a detail view showing a portion of the mechanism used for controlling the height of the fuel in the carbureter.

Referring to the drawings in which similar reference numerals designate corresponding parts throughout the several views, 1 is a receptacle comprising the body of my improved form of carbureter. The receptacle 1 may be of any desired form, but is preferably rectangular in cross section.

The receptacle 1 is provided with a base 2, the central portion of said base being provided with a circular aperture 3 therein adapted to receive a cylindrical air inlet pipe 4. The lower end of the air inlet pipe 4 is provided with an outwardly extending

flange 5, which is provided upon its upper surface with a groove 6 and the lower surface of the base 2 adjacent said groove 6 is provided with a similar groove 7 and a gasket 8 is adapted to be disposed in said grooves and to be tightly held therebetween as hereinafter more clearly set forth.

The receptacle 1 is provided with a top 9, which is formed with a substantially cylindrical mixing chamber 9^a extending above and below the same. The lower end of the mixing chamber is interiorly screw threaded and is adapted to be engaged with the exteriorly screw threaded upper end of the pipe 4 and, when said ends are engaged, the top will be tightly clamped upon the upper surface of the receptacle and the flange 5 upon said inlet pipe will be tightly clamped against the under surface of the base thereof. Arranged a short distance above the lower end of said inlet pipe is a transversely extending pipe 10, the ends thereof communicating with the interior of said receptacle 1. The central portion of said pipe 10 is provided with an upwardly extending portion 11, in which a vertically extending heater 12 is secured. The heater 12 is provided with a central bore which is open at both ends, the lower end being in communication with the pipe 10. Arranged within the tubular heater 12 is a heating coil of resistance wire 13, one end of said wire being grounded and the other end being preferably disposed downwardly through the inlet opening and extended to a suitable rheostat 14, by means of which the heat generated in the resistance coil may be regulated, as will be hereinafter more clearly set forth. The portion of the inlet pipe adjacent the upper end of the heater 12 is inwardly directed below the upper end of said heater, as shown at 15, and is then outwardly directed above the upper end of said heater, as shown at 16, so as to provide a restricted passageway about or around the upper end of said heater.

The receptacle 1 is provided upon one side with an inlet pipe 17, by means of which the liquid fuel is supplied to the receptacle 1. In order that the height of the liquid fuel in said receptacle 1 may be regulated, I provide a valve 18, which is adapted to be seated in the inner end of the inlet pipe 17. The valve 18 is carried and adapted to be operated by a lever arm 19, which is in turn controlled by a float 20, formed of cork or other suitable material. The upper

end of the lever 19 is adapted to be guided by a loop 21, extending inwardly from the side of the receptacle 1 above said inlet pipe, and the lower end of said lever is provided with a bearing 22 adapted to loosely receive the shaft 23. One end of the shaft 23 is journaled in a seat 24 in one side of the casing, as clearly shown in Fig. 6. Sleeves 25 and 26, each having an arm 27 thereon near their adjoining ends, are secured to the shaft 23 by means of set screws 28. The other end of the shaft 23 is adapted to extend through the side of the receptacle 1, a suitable packing gland 29 being provided to prevent leakage of the liquid fuel. The outer end of said shaft 23 is provided with a spring arm 30 which is adapted to frictionally engage a rack 31 formed upon the adjacent portion of the casing, as clearly shown in Fig. 1.

A controlling lever 32 is secured to one portion of the float 20, by means of a bolt 33 or in any other desired manner, said lever 32 being extended to bear against a portion of the lever 19 a distance above its lower end. The lever 32 is provided with a downwardly extending arm 34 which is out of alinement with the lever and is provided at its lower end with a T-head, the ends of said head being provided with bearings 35, which are journaled in the ends of the arms 27.

It will be seen from the foregoing description that when the liquid fuel reaches a predetermined height in the receptacle 1, the float will be elevated and the end of the lever 32 will bear against the lever 19 and force the valve 18 against its seat and will prevent a further quantity of the liquid fuel from entering the receptacle 1 until a portion of said fuel in said receptacle has been used. The height at which the float 20 will operate the valve 18 may be changed as desired. If desired to have the float close the valve 18 at a lower level than that shown in Fig. 1, the arm 30 is moved so as to position the arms 27 more nearly in alinement with the arm 19. By this arrangement the position of the float 20, at which the valve 18 will be seated in the inlet 17 to prevent the supply of additional liquid fuel, will be varied, and by properly adjusting the arm 30, any desired maximum level of liquid fuel may be secured in the receptacle 1.

When the combustion engine with which the carbureter is associated is running at high speed, it is desirable to employ an auxiliary air inlet valve which will normally be out of operation. With this purpose in view, I provide the upper portion of the outlet pipe 9^a with a valve seat 36 in one side thereof, with which is adapted to cooperate an inwardly opening valve 37 carried by a curved arm 38. The inner end of said arm 38 is pivotally secured to the ad-

jacent portion of the pipe forming the outlet opening, the pivotal point of said arm being below and beyond the plane of the valve carried thereby. Said arm 38 is also provided with an extension 39 and a spring 40 is connected to said extension 39, the other end of said spring being connected by a suitable swivel joint 41 to a tension screw 42, which extends through the opposite wall of said outlet opening so that the end of said screw may be readily operated from the outside of said carbureter when it is desired to increase or decrease the tension of said spring 40. The screw 42 and the spring 40 are positioned so as to extend in a line passing below the pivot point of said arm 38 and by this construction it will be readily apparent that the valve 37 will be normally held against its seat. It will also be seen that by increasing or decreasing the tension of the spring 40, the amount of suction in said outlet pipe 9^a necessary to unseat said valve may be increased or decreased as desired.

The rheostat 14 is preferably mounted directly upon one side of the carbureter, although I desire it to be understood that said rheostat may be mounted in any desired suitable position. An arm 45 is pivotally mounted upon a stud 46 secured to the insulating base of the rheostat and said arm is adapted to engage and to be moved over an arcuately arranged contact 47 and a plurality of contact buttons 48. One end of the contact 47 is connected to a suitable source of EMF, as indicated at 49, the other terminal of the source of EMF being connected through a suitable switch 50 to one side of the coil 13, the other side of said coil being grounded. The contact buttons 48 are connected to sections of a resistance 51 and one of the end contact buttons 48 is grounded. The arm 45 is pivotally connected by means of a link 52 to one arm of a bell crank lever 53, the other arm of said bell crank lever being connected to an operating rod 54, which extends to a convenient point upon the dash board of the vehicle, whereby the same may be operated when desired, for a purpose hereinafter set forth. Also pivotally secured upon the stud 46 is a controlling arm 55, which is pivotally mounted between its ends. One end of said controlling arm 55 has secured thereto one end of a spring 56, which extends beyond the end thereof and in alinement therewith, the other end of said spring being secured to the arm 45. The opposite end of said controlling arm 55 is slotted and a pin 57 carried by a link 58 is adapted to extend therethrough. The outer end of the pin 57 is screw threaded and adapted to receive a wing nut 59 thereon, by means of which the relative arrangement of the arm 55 and link may be changed as desired. The oppo-

site end of the link 58 is secured in like manner to the slotted arm of the bell crank lever 60. By employing the slotted arms 55 and 60 and the connecting rod 58, the relative movement of said arms may be adjusted as desired. The bell crank lever is secured upon one end of a shaft 61, which extends through the walls of the inlet pipe 9^a. Said shaft 61 has rigidly secured thereto a butterfly valve 62, as clearly shown in Fig. 4. The other end of the bell crank lever 60 is pivotally secured to an operating rod 63, which in turn is operatively connected to a suitable lever (not shown) preferably arranged upon the steering post of the vehicle.

When the vehicle is not in use the arm 45 is preferably positioned so as to engage the end contact button adjacent the contact button shown in the drawings to be engaged thereby, and when in this position the butterfly valve 62 is nearly closed as shown in full lines in Fig. 4.

When it is desired to start the vehicle it is necessary to provide means for quickly vaporizing the liquid fuel. In this position it will be seen that all the resistance 51 is in circuit and the coil 13 will not be heated. When it is desired to start the vehicle the rod 54 is operated so as to move the arm 45 over the series of contacts so that sufficient current will be permitted to pass through the coil 13 to heat the same to a high degree. The position of the controlling arm 55 will not be changed when the rod 54 is operated, as the spring 56 will allow relative movement of the arms 45 and 55. As soon as the coil 13 has been heated sufficiently the operating rod 54 is released and the spring 56 will immediately return the arm 45 into alinement with the arm 55. The operating lever connected to the rod 63 is then operated so as to slightly open the butterfly valve 62 and the engine may be cranked or started in any desired manner. When it is desired to increase the speed of the engine the operating lever may be further operated so that the arm 45 will be moved farther over the series of contact buttons 48 to reduce the resistance in circuit and the valve 62 will also be further opened. The liquid fuel in the tube 12 will be quickly vaporized by the heat generated in the coil 13 and, when the combustion engine is in operation, the vaporized fuel will be thoroughly mixed with air and will be drawn into the cylinders of said engine and there ignited in the usual manner.

From the foregoing description it will be seen that I have provided means whereby the height to which the liquid fuel may be raised in the receptacle 1 may be changed as desired. It will further be seen that I have

provided means whereby the vaporization of the fuel may be controlled as desired.

As shown in the drawing the upper end of the tube 12 is outwardly flared in the outwardly flared portion of the pipe 4 and it will thus be seen that when air is drawn through the pipe 4 by the engine, the vaporized fuel and air will be thoroughly mixed. When the engine is going at a high rate of speed the suction caused thereby in the outlet pipe 9^a will be sufficient to unseat the valve 37 so that a greater quantity of air may be mixed with the vaporized fuel than could be drawn through the inlet pipe 4.

By regulating the rheostat 14, the heat generated by the coil 13 will be increased or decreased so that the liquid fuel will be vaporized faster or slower, as desired.

While I have shown the preferred form of my invention I desire it to be understood that certain modifications may be made therein, if desired, without departing from the spirit and scope of my invention.

What I claim as new is:

1. In a carbureter the combination with a receptacle, a fluid passage extending vertically therethrough, and a fuel outlet extending upwardly in said fluid passage; of a heating coil for said outlet, resistance sections in circuit with said heating coil, a valve in said fluid passage, and means to simultaneously vary said resistance sections and control said valve.

2. In a carbureter the combination with a receptacle, a fluid passage extending vertically therethrough, and a fuel outlet extending upwardly in said fluid passage; of a heating coil for said outlet, resistance section in circuit with said heating coil, a valve in said fluid passage, means for varying said resistance, and additional means to simultaneously vary said resistance and control said valve.

3. The combination with a receptacle adapted to contain liquid fuel, a fluid passage in said receptacle, a valve in said fluid passage, and a fuel outlet extending into said passage; of a heating coil for said outlet, a variable resistance in circuit with said coil, a movable contact arm for varying said resistance, means connected to said arm whereby the resistance may be varied at will, a resilient connection between said arm and said valve, means connected to said valve whereby the positions of the valve and arm may be simultaneously varied.

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

JOHN A. THOMPSON.

Witnesses:

L. E. CORLETT,
E. P. COFFIN.

