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P. A. POPPE.

SPRAY CARBURETER.

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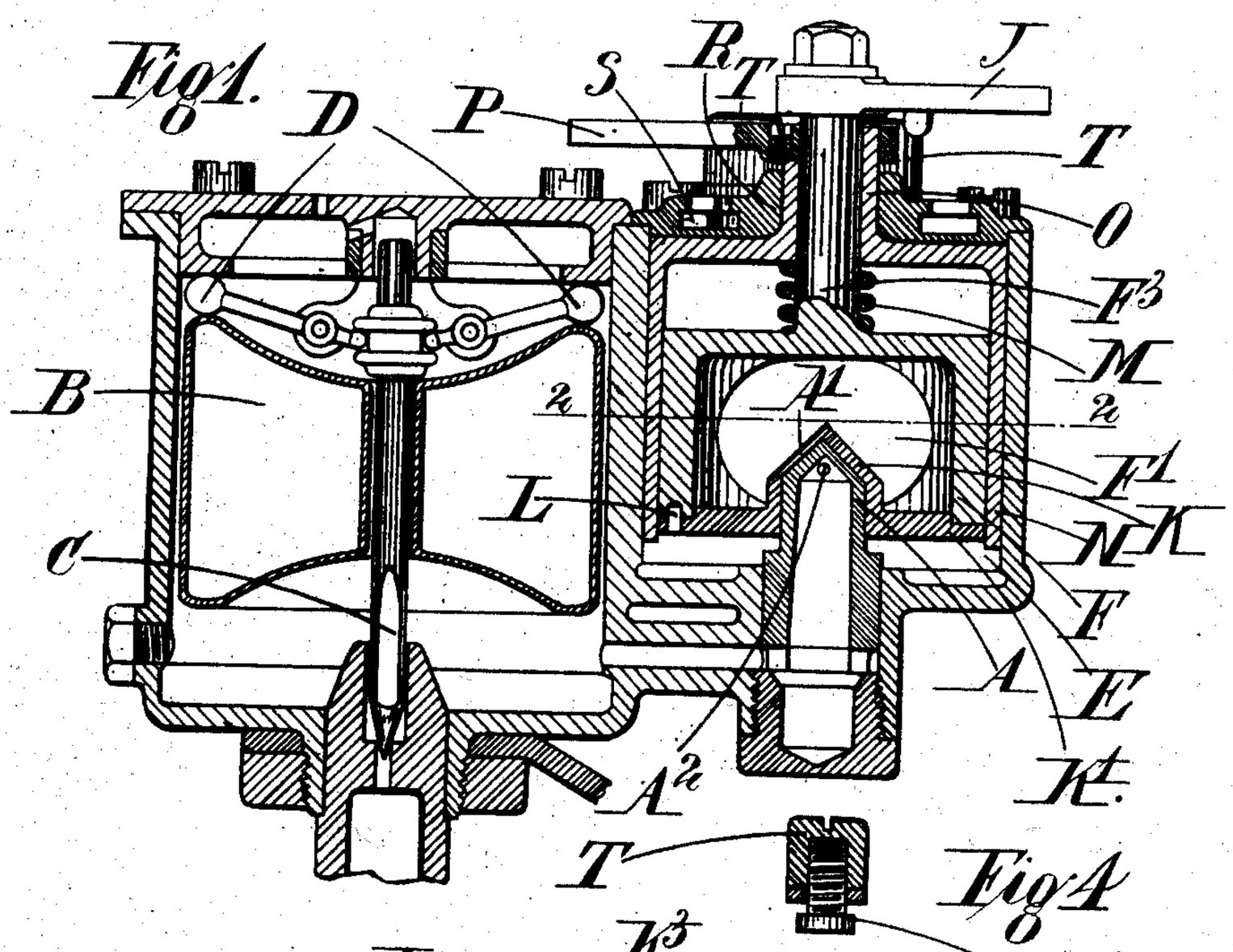

Witnesses.

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PETER AUGUST POPPE, OF COVENTRY, ENGLAND.

SPRAY-CARBURETER.

No. 883,740. Specification of Letters Patent. Patented April 7, 1908.

Application filed January 15, 1907. Serial No. 352,358.

To all whom it may concern:

Be it known that I, PETER AUGUST POPPE, a subject of the King of Great Britain, residing at Coventry, in the county of Warwick, England, have invented certain Improvements in Spray-Carbureters, of which the following is a specification.

This invention relates to spray carbureters for internal combustion engines, and has for its object to provide simple means for controlling the same, and for obtaining correct proportions of fuel to air under all conditions.

A further object is to provide means for adjustment whereby such proportions can be varied.

According to this invention, around the jet nozzle is arranged a hollow cylindrical plug cock adapted to control the air admitted to the mixing or jet chamber on the one side, and the carbureted air outlet on the other side, and attached to this rotatable plug cock is a device whereby the outlet from the jet nozzle is simultaneously controlled.

In one construction, the jet nozzle may have its outlet eccentric, and over the nozzle may be arranged a cap having a similar eccentric orifice, the cap being connected to the rotatable plug cock so that the holes in the cap and jet nozzle may be caused to coincide wholly or partially according to requirements.

In another construction, the rotatable cock may carry a needle valve which is adapted to screw into or out of the jet nozzle and so cut down or enlarge the outlet. In this case the screw thread which raises or lowers the needle valve, or its seating, may be varied in shape to obtain the required result.

In the accompanying drawings, Figure 1 is a central vertical section of one form of carbureter constructed according to this invention. Fig. 2 is a part horizontal section on the line 2—2 of part of same. Fig. 3 is an enlarged sectional view showing the jet-nozzle controlling-device, the parts being separated slightly for the sake of clearness. Fig. 4 is a side elevation of one of the adjustable stops employed, and Fig. 5 is a section showing part of a modified form of carbureter.

Like letters indicate like parts throughout the drawings.

In the construction illustrated in Figs. 1 to 4, the fuel is maintained at a constant height in the jet nozzle A by means of a float B acting on the needle valve C through the medium of levers D in the usual manner.

The jet chamber E is formed so as to receive a cylindrical plug cock F, cut away at F^1 F^2 as shown. This cylindrical cock is arranged concentrically with the jet nozzle A and is adapted to control the air-inlet G to the jet chamber, and the carbureted air outlet H from the jet chamber. This is effected by rotating the plug cock as will be easily understood. For this purpose the plug cock is provided with a spindle F^3 suitably supported, and having attached to it a lever J whereby it is rotated.

The jet nozzle A, as will be seen, especially in Fig. 3, is of somewhat larger dimensions than usual, and is conveniently conical at its upper end A^1. On this upper end bears a cap K formed at its base with a disk K^1 having in it a hole K^2. Into this hole K^2 projects a pin L, carried by the rotatable plug cock F. This plug cock bears upon the disk K^1, the pin L engaging the hole K^2 so that rotation of the plug cock rotates the disk K^1 and the cap K. To insure the cap K fitting closely upon the top of the jet nozzle, a spring M is interposed between the top of the plug cock and any suitable abutment, tending to force the plug cock, and consequently the disk K^1 and cap K downwardly.

In the upper end A^1 of the jet nozzle is made the usual small outlet for the fuel. This is arranged eccentrically, as shown at A^2, and in the cap K is a similarly eccentric hole K^3, which is adapted to coincide with the hole A^2 in the jet nozzle, when in one position of the cap and plug cock, and to gradually move out of line with the hole A^2 as the plug cock is rotated. Thus the outlet from the jet nozzle is minutely controlled by the rotation of the plug cock.

In operation it will be understood that the air to be carbureted enters at G, and passing at a high velocity around the jet nozzle A, takes up some fuel and is carbureted. This carbureted air passes out by way of the outlet H, to be used as required. To throttle down the supply of carbureted air the plug cock F is rotated by means of the lever J to the required position, this effecting the desired purpose by bringing less of the cut-away portion F^1 opposite the outlet H. Further, it will be seen that the air inlet G is similarly and simultaneously cut down by the plug cock. At the same time also the

rotation of the plug cock rotates the disk K^1 and cap K, which, as mentioned above, reduces the outlet for the fuel from the jet nozzle A. Thus, it will be seen that the air inlet, fuel outlet and carbureted air outlet are all controlled simultaneously.

For purpose of primary adjustment in fitting the carbureter, the holes A^2 K^3 can be arranged at any suitable distance from the center by varying which different effects are obtained. Again, further adjustment can be obtained by varying the position of cut-off of the plug cock in regard to the inlet G and outlet H. For this purpose between the plug cock and the wall of the jet chamber is arranged a cut-off cylinder N. This has cut-away portions N^1 corresponding to the cut-away portions F^1 F^2 of the plug cock, and is provided with a suitably supported stem O to which is attached a lever P enabling it to be rotated as desired.

Suitable stops are made to limit the rotation of the lever J, and similarly locking devices may be made for the lever P, so as to lock the latter in the correct position after the primary adjustments have been made. For this purpose the cover R of the spraying chamber is formed with a circular track or recess S, in which lie stops. These consist of nuts T carried by screws T^1, the heads of which lie in the recess S. These stops, as will be seen, stand up above the cover R into the path of the levers P and J. As they are adjustable in the recess S, they may be set apart to provide stops limiting the motion in either direction as is the case of the lever J, or a pair of them may be adjusted to bear against the lever P, one on each side to prevent that lever being moved accidentally after the primary adjustments have been made.

In the modification illustrated in Fig. 5, the jet nozzle A^2 is open concentrically at the top, the orifice being slightly conical as will be seen at A^3. Standing up in the jet chamber are a number of supports or columns U which support a bearing plate V. Through a hole in this bearing plate V passes a needle valve W, the lower end of which is adapted to drop into the conical orifice A^3, while the upper end V^1 is screw-threaded and engages a screw-threaded hole F^4 in the plug cock spindle F^3. The needle valve W is made non-circular in cross section at the part W^1 where it passes through the bearing plate V. The hole in the bearing plate is similarly shaped, so that the needle valve is held against rotation but can rise and fall. Rotation of the plug cock F by means of the lever J, causes the needle valve W to rise and fall owing to the engagement of its screw-threaded portion therewith. In this manner the jet nozzle orifice is enlarged or decreased simultaneously with the air inlet and the carbureted air outlet.

What I claim and desire to secure by Letters Patent of the United States is:—

1. In combination, a jet nozzle, means for maintaining the fuel at a suitable height therein, a mixing chamber having an inlet thereto and an outlet therefrom, a rotatable plug cock arranged in said chamber and adapted to control said inlet and said outlet, a jet-nozzle controlling device connected thereto, and an adjustable cylinder arranged around said plug cock with holes in said cylinder corresponding with said inlet and to said outlet of the mixing chamber, substantially as set forth.

2. In combination, a jet nozzle, having an eccentric orifice, means for maintaining the fuel at a suitable height therein, a mixing chamber having an inlet thereto and an outlet therefrom, a plug cock rotatable in said chamber, a cap for the jet nozzle rotatable by said plug cock with a hole in said cap corresponding to said orifice in the jet nozzle, an adjustable cylinder arranged around said plug cock with holes corresponding with said inlet to and said outlet from the mixing chamber, substantially as set forth.

3. In combination, a jet nozzle having an eccentric orifice, means for maintaining the fuel at a suitable height therein a mixing chamber having an inlet thereto and an outlet therefrom, a plug cock rotatable in said chamber, a pin on said plug cock, a cap for the jet nozzle rotatable by said plug cock, with a hole in said cap corresponding with said orifice in the jet nozzle, a disk on said cap with a hole engaged by said pin on the plug cock, an adjustable cylinder arranged around said plug cock with holes in said cylinder corresponding with said inlet to and said outlet from the mixing chamber, substantially as set forth.

4. In combination, a jet nozzle having an eccentric orifice, means for maintaining the fuel at a suitable height therein, a jet chamber having an inlet thereto and an outlet therefrom, a plug cock rotatable in said chamber, a pin on said plug cock, a cap for the jet nozzle rotatable by said plug cock with a hole in said cap corresponding to said orifice in the jet nozzle, a disk on said cap with a hole in said disk engaged by said pin on the plug cock, an adjustable cylinder arranged around said plug cock with holes in said cylinder corresponding with said inlet to and said outlet from the jet chamber and a spring bearing on said plug cock, substantially as set forth.

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

PETER AUGUST POPPE.

Witnesses:
ERICH WALPRE,
JOHN T. FAZAKARLEY.