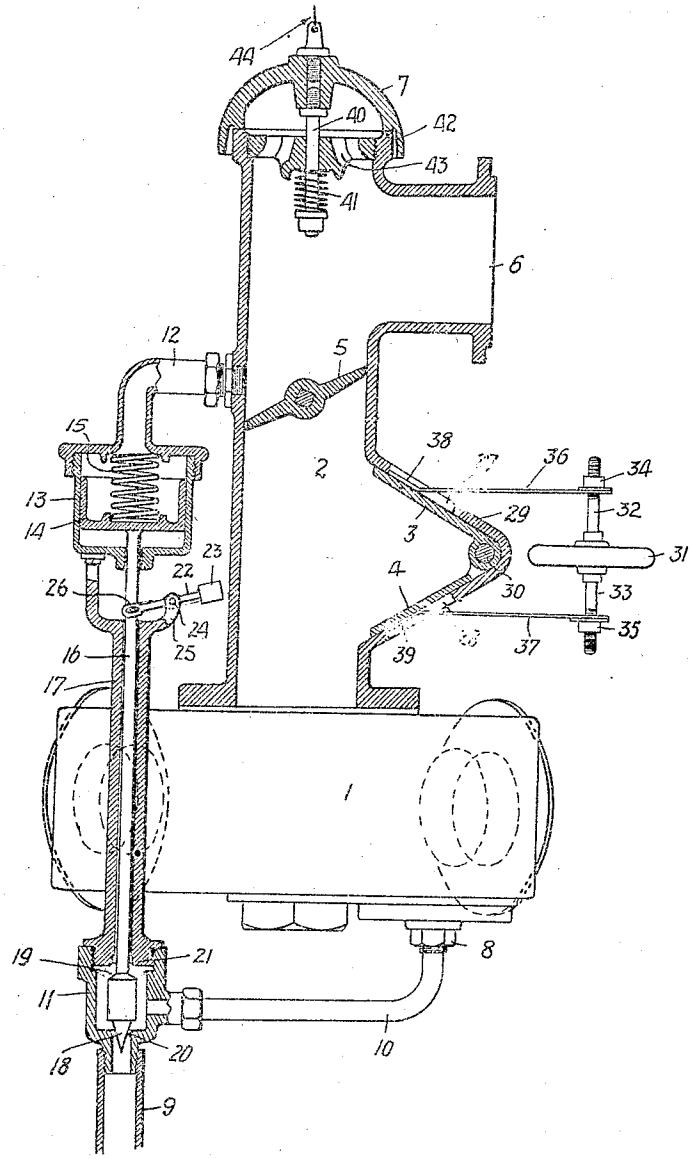
C. L. STOKES.

OIL FEED CONTROL FOR CARBURETERS.

APPLICATION FILED MAY 23, 1916.

1,312,814.

Patented Aug. 12, 1919.



C. L. Stokes.
Inventor.

By Thompson & Macklo
Attorney.

UNITED STATES PATENT OFFICE.

CHARLES LAWRENCE STOKES, OF MILLONG, VIA YOUNG, NEW SOUTH WALES, AUSTRALIA.

OIL-FEED CONTROL FOR CARBURETERS.

1,312,814. Specification of Letters Patent. Patented Aug. 12, 1919.

Original application filed August 5, 1915, Serial No. 43,761. Divided and this application filed May 23, 1916. Serial No. 99,417.

To all whom it may concern:

Be it known that CHARLES LAWRENCE STOKES, citizen of the United States of America, residing at Millong, via Young, New South Wales, Australia, has invented certain new and useful Improvements in Oil-Feed Controls for Carbureters, which are divided out from his prior application, Serial No. 43,761, dated August 5, 1915, and of which the following is a specification.

The invention relates to valved oil feed controls and has for one of its objects a means whereby suction of an engine or the like serves to control or regulate a valved flow of fuel of a carbureter.

The invention comprises a piston or the like, which on being subjected to suction, controls or regulates by its movement a fuel valve leading to the carbureter.

Such fuel valve control engine suction need not necessarily open the fuel port to its fullest extent, but the spring pressure or the like against which the suction operates may regulate the fuel flow in proportion to the engine suction. This type of regulation will depend merely on the stiffness of the spring or the like provided.

In carrying out a further object of the invention I provide a fuel valve control which although below the normal level of the source enables me to dispense with all kinds of packings or glands which would necessarily interfere with the responsiveness with which the fuel control or regulator would be susceptible to the engine suction.

Moreover, I contemplate regulating the responsiveness of the suction fuel valve by varying the play of the spring controlling the valve piston.

In the accompanying drawing which illustrates a carbureter in vertical section with my said invention applied to it, 1 is a vaporizing chamber of the carbureter, 2 the mixing chamber thereof, 3 and 4 air admission valves, 5 throttle valve, 6 opening connected to the engine induction system, 7 manually controlled additional air valve, 8 inlet connection for fuel oil, 9 fuel oil feed pipe through which oil is supplied under an approximately constant head of pressure, 10 connection from valve chamber 11 at end of pipe 9 to feed connection 8 of the carbureter, 12 pipe connection from upper part of carbureter to cylinder 13.

The piston 14 is a free sliding fit in the cylinder 13. A helical spring 15 in compression is fitted above said piston 14 and acts to press same downward. 16 is a valve stem attached to the piston 14 and passing freely through a tube 17, the lower end of which is screwed into the top of the valve case 11. On the lower end of the stem 16 is a valve 18; said stem may also have a reverse valve face 19 formed upon it. The valve 18 is adapted to co-act with a seating 20, and the valve face 19 is adapted to co-act with a seating 21 at the foot of the pipe 17. The pipe 17 is of sufficient height to extend above the level to which the oil would rise in said pipe under the head or pressure applied to it; thus a stuffing box is rendered unnecessary and sticking of the valve stem is avoided, the valve stem being easily movable under the action of the suction or of the spring. The weight of the valve and its stem and piston may be counterbalanced in any convenient way, as by the means diagrammatically indicated in the drawing, such means consisting of a lever 22 with counterweight 23 fulcrumed at 24 on a bracket 25 and pivotally connected at 26 to said stem 16, such counterbalancing facilitating the movement of the valve by the engine suction. The air shutters 3 and 4 are flap valves closing against apertures 27 and 28 on either side of an angularly disposed chamber 29 forming part of the mixing chamber 2. These air valves are hinged on one pintle 30 which is mounted in the part 29. 31 is a thumb wheel having two screwed spindles 32 and 33 at either side of it, threaded right and left hand respectively. These spindles work through nuts 34 and 35 fixed on the ends of leaf springs 36 and 37,

the other ends of said springs being attached to the valves 3 and 4 at 38 and 39 respectively. The weight of the thumb wheel 31 with its spindles counterbalances the weight of the valves 3 and 4, said thumb wheel and said valves being respectively on either side of the pivotal center 30, so that if the said valves were not in contact with their seatings the weight of said thumb wheel and its spindles overhanging the center 30 would prevent them falling by gravity around the pintle 30. The tension on the springs 36 and 37 which is varied by turning the thumb wheel 31 operates to hold the valves 3 and 4 more or less tightly against their seatings, so that their sensitiveness is thus readily adjusted. Said valves are opened automatically by the external pressure of air on them when the throttle 5 is opened so as to bring the atmosphere in the mixing chamber 2 below atmospheric pressure. As the valves open they move toward each other and they tend to move the outer ends of the springs apart. As this is prevented by nuts 34, 35, the springs are tensioned and tend to return the valves to closed positions when the pressure in the mixing chamber rises.

For the valves 3 and 4 any other known form of spring loaded automatic air valve may be substituted. The manual additional air valve 7 is a cap the spindle 40 of which is fitted with a closing spring 41 which holds the valve face down on the seat 42. 43 are air ports. 44 is a flexible wire or other mechanical connection to a hand lever, said hand lever being placed within easy reach of the driver.

In operation, oil is supplied through the pipe 9 under an approximately constant head. Flow of same to the carbureter is checked by the valve 18 until the engine is started up, producing a suction in the upper part of the carbureter. This suction exists also in the upper part of the cylinder 13 through its pipe connection 12 to the carbureter, and relieving more or less the atmospheric pressure above the piston 14, permits atmospheric pressure below it to force it upward, thereby bringing up the stem 16 and lifting the valve 18 off its seat, and immediately thereafter closing the valve 19 on its seat 21 whenever a full lift of the valve occurs. Oil may now flow through the pipe 9 the valve case 11 and pipe 10 to the carbureter inlet connection 8, the extent of opening of the valve 18 being determined by the degree of engine suction and the stiffness of the spring 15. The counterbalance 23 acting through the lever 22 supports the static weight of the piston, its stem, and the valve and so the valve is controlled only by the action of the spring 15 on the one hand and the degree of vacuum due to engine suction on the other hand.

The construction of the mixing chamber of the carbureter is immaterial to the invention, as the invention is applicable to any type of carbureter receiving oil under head from a source external to it, and vaporizing said oil to produce an explosive mixture for delivery into an engine.

Yet it is clear that my suction controlled fuel valve is not necessarily limited to this type of carbureter. Wherever it is of advantage to use a valve shut off which is to be opened by an initial suction of a suction producing device, the above described valve control can be installed.

Depending on the size and outlets of the chamber 13, the outlet branch 12 and the strength of the spring 15 in certain adjustments, it is clear that during normal operation of the engine the valve 18 will be maintained in full open position.

As the function of the piston 14 is to move in response to variations in the degree of vacuum in the induction of the engine its particular form is immaterial, and it may be substituted by any equivalent device.

What I claim as my invention and desire to secure by Letters Patent is:—

1. Mechanism for controlling the fuel supply of carbureting means for internal combustion engines, comprising in combination, a chamber separate from and independent of said carbureting means and adapted to be connected to the inlet pipe of an engine, means within said chamber movable in one direction under engine suction, a valve chamber having an inlet adapted to be connected to a fuel supply and an outlet adapted to be connected to said carbureting means, a valve in said valve chamber controlling the passage of fuel from the inlet to the outlet, said valve having a valve stem connected to and operable by said movable means, and a tubular member loosely surrounding said stem and having its upper end above the highest level to which the fuel can rise therein under its head pressure.

2. Mechanism for controlling the fuel supply of carbureting means for internal combustion engines, comprising in combination, a chamber separate from and independent of said carbureting means and adapted to be connected to the inlet pipe of an engine, means within said chamber movable in one direction under engine suction, a valve chamber having an inlet adapted to be connected to a fuel supply and an outlet adapted to be connected to said carbureting means, a valve in said valve chamber controlling the passage of fuel from the inlet to the outlet, said valve having a valve stem connected to and operable by said movable means, and counter-balancing means connected to said valve stem.

3. The combination with the inlet pipe of an internal combustion engine and carbureting means connected to said pipe, of a valve

chamber having a fuel inlet, a fuel conduit extending from said chamber to said means, a valve within said chamber controlling the passage of liquid fuel from said inlet to said conduit, a chamber independent of said carbureting means, a conduit connecting said chamber to said inlet pipe, means within said chamber operable by engine suction, a valve stem between the last mentioned means and said valve for operating the latter, and a tubular member carried by the upper wall of the valve chamber and loosely surrounding said valve stem, said member extending upwardly above the highest level to which the liquid can rise therein under its head pressure.

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

CHARLES LAWRENCE STOKES.

Witnesses:
H. C. CAMPBELL,
W. I. DAVIS.