F. O. BALL.

CARBURETER.

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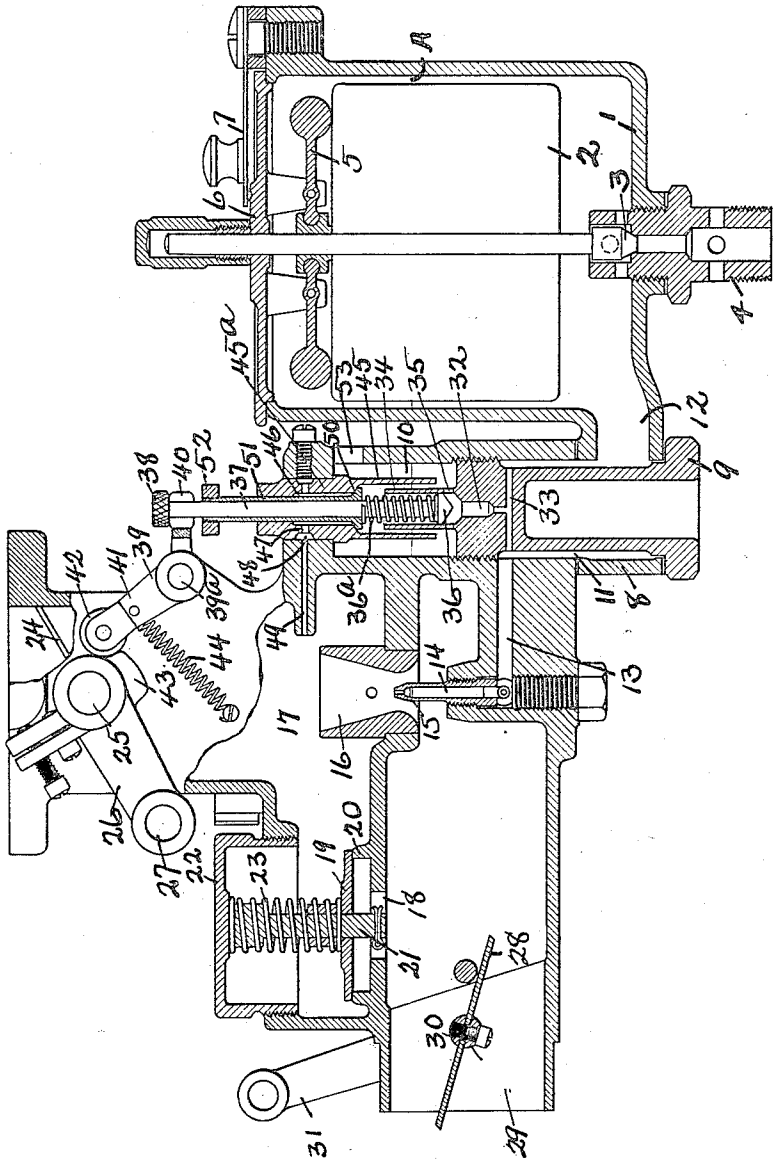
1,243,479. Patented Oct. 16, 1917.



Inventor

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By

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UNITED STATES PATENT OFFICE.

FREDERICK O. BALL, OF DETROIT, MICHIGAN, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO BALL & BALL CARBURETOR COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

CARBURETER.

1,243,479. Specification of Letters Patent. Patented Oct. 16, 1917.

Application filed August 30, 1916. Serial No. 117,606.

To all whom it may concern:

Be it known that I, FREDERICK O. BALL, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to carbureters and consists in certain improvements in the construction thereof as will be hereinafter fully described and pointed out in the claims.

It is desirable to momentarily supplement the normal fuel supplied to the carbureter as the throttle is opened. Such devices are usually termed pick-up devices and this invention has particular reference to this feature. The drawings show a vertical central section through the carbureter, small portions being shown in elevation to better show construction.

1 marks the float chamber, 2 the float, 3 the inlet valve, 4 the inlet connection, 5 the mechanism for communicating the movement of the float to the valve, 6 the cover and 7 the clip for holding the cover in place.

The float chamber has a projection 8 extending under the body of the carbureter and is secured to the body of the carbureter by a screw 9 which extends through the extension 8 and forms a closure for a chamber 10. The screw has a reduced portion forming a passage 11 which communicates with the passage 12. A passage 13 extends into the body of the carbureter from the passage 11 and communicates with a passage 14 leading to the nozzle 15. The nozzle is arranged in the Venturi tube 16 forming an initial air opening of the carbureter. The Venturi tube opens into the mixing chamber 17. An auxiliary air opening 18 is provided. This is controlled by a yielding valve 19 operating on the seat 20. The valve is guided by a pin 21 extending from a cap 22. A spring 23 yieldingly holds the valve to its seat. A throttle valve 24 is arranged on the stem 25. It is operated through a lever 26, the lever 26 having the usual eye to which the throttle controlling device may be attached. A choke valve 28 is also provided at the air inlet 29. This is mounted on the stem 30, the stem being controlled by a lever 31. So far as described this may be any desirable form of carbureter.

Radial passages 33 are arranged in the screw 9 and communicate with an axial passage 32 leading to the chamber 10. An upwardly extending cup or passage 34 is arranged at the upper end of the screw and this has radial openings 35 communicating with the chamber 10. A needle valve 36 is adapted to close the passage 32. It is carried by a stem 37 which terminates at its upper end in a collar or shoulder 38. A bell crank lever 39 is pivotally mounted on the carbureter by means of a pin 39ª. One arm 40 is adapted to engage the shoulder 38 as the lever is swung. The opposite arm 41 has a roller 42 arranged in the path of a cam 43 on the lever 26. A spring 44 tends to hold the arm 40 of the lever 39 in its upper position as shown. When the throttle is opened the cam 43 operating against the roller 42 swings the arm 41 toward the left depressing the arm 40. The spring 36ª then closes the valve 36. A cylindrical projection 45 extends over the projection 34 and is carried by a plug 45ª extending upwardly through the upper walls of the chamber. The plug 45ª has an axial passage 46. Radial passages 47 extend from the passage 46 into an annular passage 48 formed by a groove in the plug. The passage 48 communicates with a passage 49 in the body of the carbureter leading to the mixing chamber adjacent to the Venturi tube.

A valve 50 controls the passage 46. This valve has a sleeve-shaped stem 51 which extends upwardly through the plug 45 and is arranged around the stem 37. The stem 51 terminates in a collar 52. The spring 36ª is arranged against the valve 50 so that when the stem is released the valve 50 is closed. When the throttle is opened and the arm 40 depressed it engages the collar 52 and opens the valve 50. A passage 53

leads from the upper end of the chamber 10 to the open air.

The operation of the device is as follows:—When the throttle is closed the valve 36 is open and the fuel passes by gravity through the passage 12, passage 11, passages 33 and 32 to the chamber 10, filling it to the level of fuel in the float chamber, this level being indicated at A. Under these conditions the valve 50 is closed so that neither air nor fuel can enter through the passage 49. When the throttle is opened, the valve 36 is first closed and then the valve 50 opened through the movement of the arm 40 and this through the action of the cam 43. With the valves in this position, that is, the valve 36 closed and the valve 50 open the suction incident to the reduced pressure in the mixing chamber draws the fuel from the fuel chamber through the cylinder 45, passage 46 and intermediate passages to the passage 49 discharging into the mixing chamber a pre-determined amount contained in the chamber. As soon as this amount is discharged there can be no further filling of the fuel chamber nor discharge of fuel from this source until the throttle is again closed. When this happens the valve 50 is closed and the valve 36 opened permitting the receptacle 10 to again fill.

In this way a pre-determined amount of fuel is discharged to the mixing chamber when the throttle is opened and after this pre-determined charge is delivered there is no interference with the normal functioning of the carbureter.

What I claim as new is:—

1. In a carbureter, the combination of a mixing chamber; means for supplying air and the normal fuel to said chamber; a throttle valve; devices for augmenting the normal fuel supply after the throttle is opened comprising a receptacle having a supply passage leading from a fuel supply and a discharge passage leading to the mixing chamber; valves for said passages; and means acting when the throttle is actuated for actuating said valves alternately to close the supply passage and open the discharge passage when the throttle is opened and to close the discharge passage and open the supply passage when the throttle is closed.

2. In a carbureter, the combination of a mixing chamber; means for supplying air and the normal fuel to said chamber; a throttle valve; devices for augmenting the normal fuel supply after the throttle is opened comprising a receptacle having a supply passage leading from a fuel supply, a discharge passage leading to the mixing chamber and a passage leading to the air; valves for said passages; and means acting when the throttle is actuated for actuating said valves alternately to close the supply passage and open the discharge passage when the throttle is opened and to close the discharge passage and open the supply passage when the throttle is closed.

3. In a carbureter, the combination of a mixing chamber; means for supplying air and the normal fuel to said chamber; a throttle valve; devices for augmenting the normal fuel supply after the throttle is opened comprising a receptacle having a supply passage leading from a fuel supply and a discharge passage leading to the mixing chamber; valves for said passages; and means having a mechanical connection with the throttle actuating when the throttle is actuated said valves alternately to close the supply passage and open the discharge passage when the throttle is opened and to close the discharge passage and open the supply passage when the throttle is closed.

4. In a carbureter, the combination of a mixing chamber; means for supplying air and the normal fuel to said chamber; a throttle valve; devices for augmenting the normal fuel supply after the throttle is opened comprising a receptacle having a supply passage leading from a fuel supply and a discharge passage leading to the mixing chamber; valves for said passages, said valves having independent stems; and mechanism mechanically actuated from the throttle valve operating on said stems to actuate said valves alternately to close the supply passage and open the discharge passage when the throttle is opened and to close the discharge passage and open the supply passage when the throttle is closed.

5. In a carbureter, the combination of a mixing chamber; means for supplying air and the normal fuel to said chamber; a throttle valve; devices for augmenting the normal fuel supply after the throttle is opened comprising a receptacle having a supply passage leading from a fuel supply and a discharge passage leading to the mixing chamber; valves for said passages, said valves being arranged concentrically, the valve controlling the supply passage having a stem and the valve controlling the discharge passage having a sleeve-shaped stem arranged around the stem of the valve controlling the supply passage; shoulders on said stems; and a lever operating between said shoulders and actuated with the throttle.

6. In a carbureter, the combination of a mixing chamber; means for supplying air and the normal fuel to said chamber; a throttle valve; devices for augmenting the normal fuel supply after the throttle is opened comprising a receptacle having a supply passage leading from a fuel supply

and a discharge passage leading to the mixing chamber; valves for said passages, said valves being arranged concentrically, the valve controlling the supply passage having a stem and the valve controlling the discharge passage having a sleeve-shaped stem arranged around the stem of the valve controlling the supply passage; shoulders on said stems; a lever operating between said shoulders and actuated with the throttle; and a spring arranged between the valves on the stem of the valve controlling the supply passage.

In testimony whereof I have hereunto set my hand.

FREDERICK O. BALL.