C. & H. BINKS.

CARBURETER.

APPLICATION FILED OCT. 21, 1913.

1,122,571.

Patented Dec. 29, 1914.

2 SHEETS—SHEET 1.

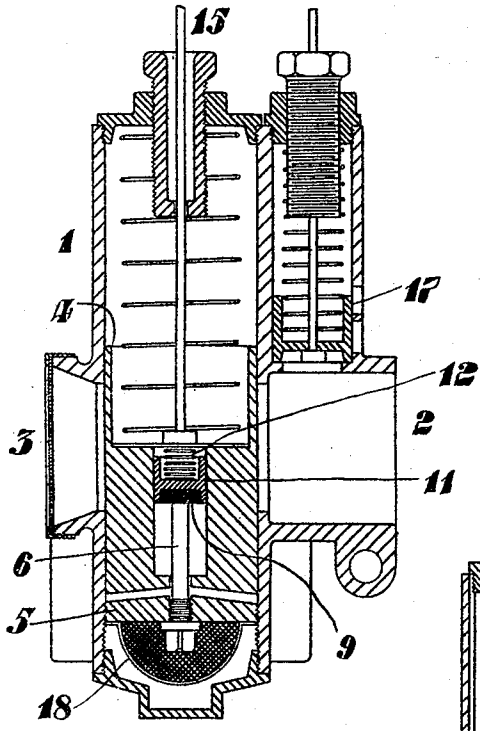

Fig. 1.

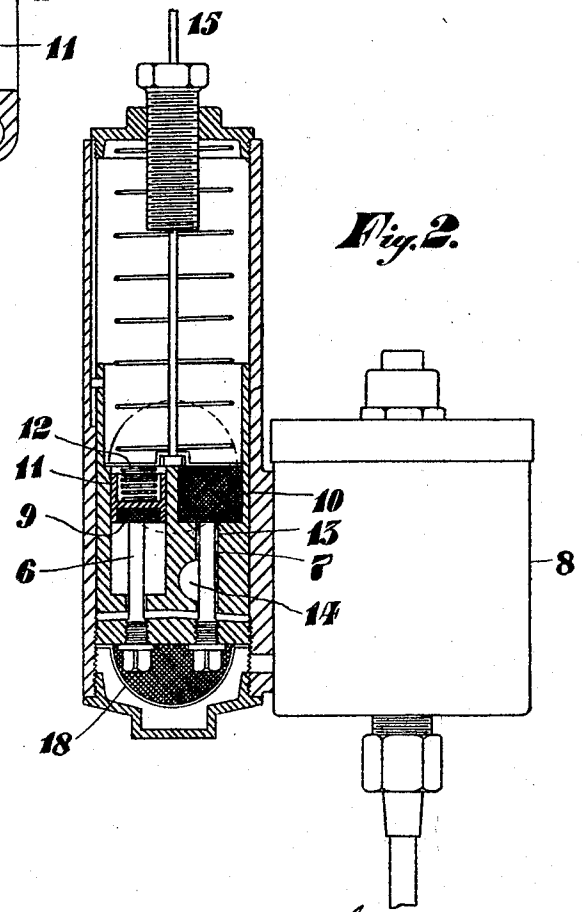

Fig. 2.

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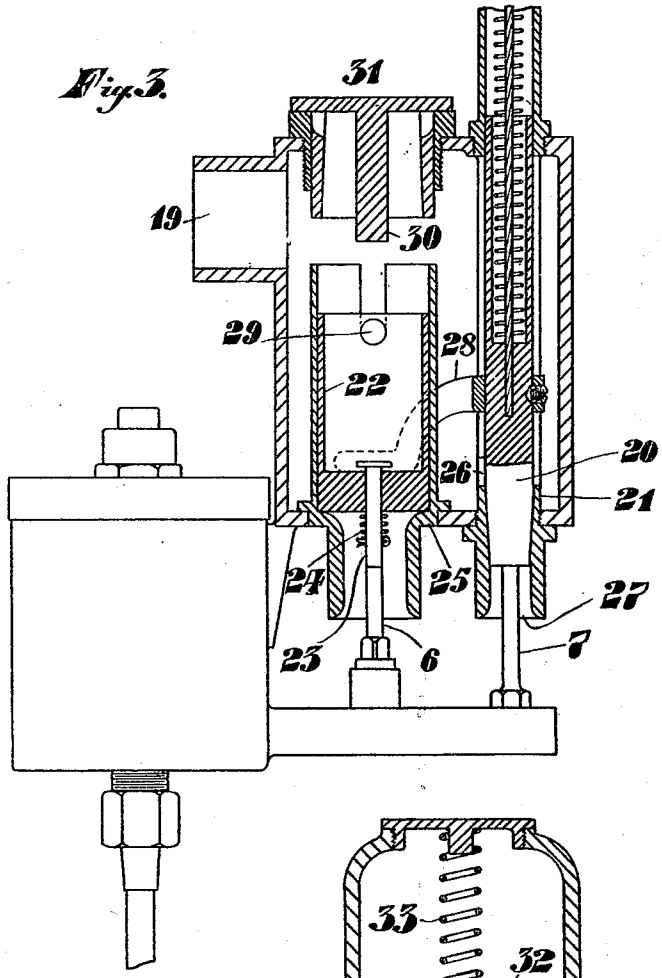
2 SHEETS—SHEET 2.

Fig. 3.



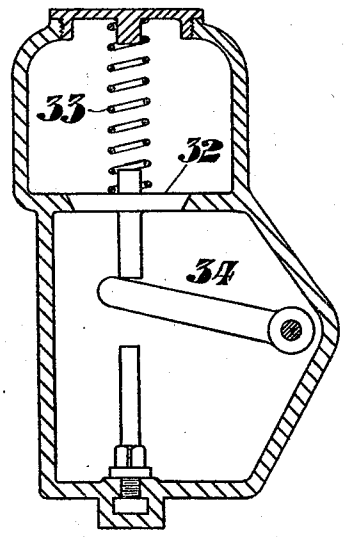


Fig. 4.

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UNITED STATES PATENT OFFICE.

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CARBURETER.

1,122,571. Specification of Letters Patent. Patented Dec. 29, 1914.

Application filed October 21, 1913. Serial No. 796,455.

To all whom it may concern:

Be it known that we, CHARLES BINKS and HAROLD BINKS, residing at 67 Snowdon road, Eccles, near Manchester, England, have invented certain new and useful Improvements in Carbureters for Internal-Combustion Engines; and we 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.

Carbureters which are made with more than one jet, and in which the jets are brought into action one after another as power is required, are liable to waste fuel, owing firstly to the petrol or the like overrunning the jets by inertia when the throttles are wholly or partially closed, secondly to the petrol being shaken out of the jets by vibration, and thirdly to the slight vacuum which occasionally exists in the induction pipe or jet chambers. These losses are liable to occur when the engine is stopped or stopping as well as when working on only one of the jets, and on carbureters that have only one jet, and the main object of this invention is to prevent such losses.

A subsidiary object is to combine with the pilot jet one or more air passages of very small area, through which when in use the air will travel at a high velocity, thereby enabling the engine to run slowly and economically.

According to this invention, a damper is combined with the throttle in such a manner that when the throttle is closed the same or a further movement causes the damper to fall on top of the jet and close the outlet from the latter. Thus each of the jets will be positively closed either immediately before or immediately after its own throttle is closed.

In order that our invention may be clearly understood, we have hereto annexed drawings illustrating examples of its practical application.

Figures 1 and 2 represent vertical sections, taken at right angles to each other, of the form of carbureter which we at present consider preferable. Fig. 3 represents a vertical section through a carbureter of another design. Fig. 4 is a diagram illustrating in vertical section a modification hereinafter mentioned.

Referring firstly to Figs. 1 and 2, the carbureter may be of any convenient shape, but preferably comprises a cylindrical throttle chamber 1, the arm 2 of which is connected to the engine, and the opposite arm 3 is open to the atmosphere. The throttle chamber may be in a vertical or any other position, but for the purpose of this description, it is assumed to be in a vertical position. The throttle 4 is tubular in its upper part, and its lower part is solid; 5 is the base through which pass the petrol nozzles 6 and 7, which may be fed from the usual float chamber 8, or in some cases it may be found desirable to dispense with the float chamber. In the throttle plug are longitudinal holes for the reception of the petrol jets when the throttle is lowered, these holes being enlarged toward the top of the plug to accommodate pads of leather or other soft substance 9 and 10 adapted to rest on the tops of the respective jets and seal the outlets thereof. The pad 10 simply rests on the top of the pilot jet 7 and is lifted clear of it as soon as the throttle rises, but the pad 9 is secured to a small plunger 11 on which acts a confined spring 12, and the enlargement of the hole in the plug below this plunger is sufficiently deep to enable the pad 9 to keep in contact with the main jet 6 for a little time after the throttle has raised the pad 10 off the pilot jet 7. Through the plug are bored two air holes 13 and 14, communicating with and at right angles to the hole in the plug which in the position shown accommodates the pilot jet 7. These holes 13 and 14 extend diametrically across or through the body of the throttle 4, except where cut into to accommodate the vertical nozzle 7. It will be seen that the air entrance through the arm 3 is completely closed by the throttle; but when it is desired to start the engine, and the throttle is drawn up by the Bowden wire 15, the pad 10 is raised off the jet 7, and the small air hole 13 is brought into communication with the air intake, so that air passes through this hole and immediately over the jet 7 at a very high velocity, and sucks petrol out of the jet to supply the engine. A further upward motion of the throttle uncovers the larger hole 14, increasing the volume of fuel mixture supplied to the engine. Just before the lower edge of the throttle rises above the bottom of the air entrance, the plunger 11 and pad 9 are lifted clear of the jet 6, so that as soon as air is admitted below the throttle this jet

also comes into action to supply the engine. The limit to which the throttle may be opened depends on the size of the main jet. Conversely, in stopping the engine, the throttle being lowered shuts off the main air entrance, then the plunger 11 seals the jet 6, then the pilot jet air entrances 14 and 13 are in turn shut off, and finally the throttle comes to rest with the pad 10 on top of the pilot jet 7, and the plunger 11 at or near the top of its stroke relatively to the throttle. The reference numeral 17 indicates the usual valve for admitting additional air to the engine, and 18 is a filtering screen.

Referring now to Fig. 3, this shows means for effecting the first-named object of this invention in a two-jet carbureter in which each of the jets 6 and 7 is in a separate choke tube, and the passage of the fuel therefrom to the passage 19, leading to the engine, is controlled by a separate throttle for each jet. While it may not be absolutely essential to close entirely the throttle on the first or pilot jet 7, when the engine stops, it is very desirable that the petrol should be shut off; and when ceasing to work on the second jet, or second and third jets where more than two jets are used, it is essential that the throttle or throttles thereof should be closed, as, if the throttle did not shut tightly on the second or third jet chamber, the suction on the first jet when working alone would be impaired. In the example shown in this figure the throttle 20 of the first jet 7, which rests on the said jet, does not fit quite gas-tight on its seat 21, which is or may be conically tapered. On the main throttle 22 a damper rod or plunger 23 passing through the closed bottom of the throttle, and controlled by a spring 24, closes down on top of the petrol jet 6 slightly before this throttle 22 reaches its seat 25, this arrangement permitting a tight closure of both petrol and air openings, which is not affected by slight variations in the relative positions of the closing members caused by wear or otherwise. When the throttle 20 in closing has covered the port 26 in its shell (through which port the communication is made from the choke tube or air intake 27 to the passage 19 when the jet 6 is at work) a slight further movement brings it down on its seat 25, on which it fits gas-tight, and the plunger 23 prevents the exit of petrol from the jet 6 so long as the throttle is down. When the throttle 20 has been lifted so as to be fully open, an arm 28 connected thereto engages a pin 29 on the main throttle 22 and lifts this throttle 22, removing the plunger 23 from the jet 6; and when further lifted, this pin 29 engages the spindle 30 of the auxiliary air valve 31 and opens this valve. The throttle 22 and air valve 31 are normally kept down by suitable springs.

Other arrangements of valves may obviously be used to effect the purpose of sealing the petrol jet; for example, where the throttle is a mushroom valve, as 32 in Fig. 4, held down by a spring 33, the pivoted lever 34 which lifts the said valve against the resistance of the said spring may when released be pressed by another spring (not shown) on to the petrol jet 35.

Claims:—

1. In a carbureter, the combination, with a throttle chamber provided with lateral air passages, and nozzles for hydrocarbon projecting within the said chamber; of a throttle plug slidable in the said chamber and provided with valves which uncover the nozzles one after another as the plug is raised, the said plug having also an air passage communicating with the nozzle which is first uncovered and placing it in communication with the said lateral air passages before they are uncovered by the throttle plug.

2. In a carbureter, the combination, with a throttle chamber provided with lateral air passages, and nozzles for hydrocarbon projecting within the said chamber; of a throttle plug slidable in the said chamber and provided with valves which uncover the nozzles one after another as the plug is raised, the said plug having also a plurality of air passages of different area which communicate with the nozzle which is first uncovered and which communicate one after another with the said lateral air passages before they are uncovered by the throttle plug and which increase the supply of hydrocarbon step by step.

3. In a carbureter, the combination, with a throttle chamber provided with lateral air passages, and nozzles for hydrocarbon projecting within the said chamber; of a throttle plug slidable in the said chamber, a valve secured to the throttle plug and normally closing one of the nozzles, and a spring-pressed valve slidable in the throttle plug and closing the other nozzle until after the first nozzle has been uncovered by the valve pertaining to it, the said plug having also an air passage communicating with the nozzle which is first uncovered and placing it in communication with the said lateral air passages before they are uncovered by the throttle plug.

In testimony whereof we affix our signatures, in presence of two witnesses.

CHARLES BINKS.
HAROLD BINKS.

Witnesses:
THOMAS BOARDMAN,
ERNEST PRIESTLY NEWTON.